ROMP TR16-2 VAN BUREN ROAD MONITOR WELLSITE

September 1990 **EXECUTIVE SUMMARY** D.J. De Witt

INTRODUCTION

The ROMP TR16-2 Van Buren wellsite is located in the SW 1/4 of the NE 1/4 of the NW 1/4, section 4, Township 26, Range 16, within the corporate limits of the City of New Port Richey, Pasco County Florida. Location coordinates delineated from the U.S. Geological Survey Port Richey Florida topographic quadrangle map place the wellsite at latitude 28 15'18", and longitude 82 42'43". The wellsite is situated on the east side of N. Van Buren Street approximately 0.35 miles north of Main St., and 1.0 miles east of U.S. Highway 19 in New Port Richey (Figure 1). Land surface elevation at the site is approximately 35 feet above sea level.

The general geographic setting in the region of TR16-2 is best described as an urbanized coastal area of west-central Florida. Physiographic elements in southwest Pasco County include two major surface water features, the Anclote River and Pithlachascotee River, which drain into the Gulf of Mexico along an esturine coastal margin. The TR16-2 wellsite is situated in a hilly upland area, approximately 1 mile north of the Pithlachascotee River, and 3 miles east of the Gulf of Mexico.

TEST CORE DRILLING

Core drilling and water quality sampling at TR16-2 first took place in January of 1982 and was completed to a total depth of 309.5 feet below land surface. Geologic formations penetrated during test drilling include undifferentiated Surficial Sand and Clay deposits, the Tampa Member of the Arcadia Fm.(Tampa Fm.), and the Suwannee Limestone. Lithologic and water quality data was generated from the corehole to develop a plan for monitor well construction at the site, but no other wells were actually drilled. An existing abandoned municipal supply well on the site was also considered for conversion into a monitor well, but no action was taken at the time to execute the plan.

Water samples were collected during core drilling of the first test hole at ten and twenty foot intervals. A relatively thin lense of fresh water was encountered between the static water level of approximately 34 feet below land surface, and 120 feet. This fresh water interval in the Floridan Aquifer was coincident with the entire thickness of the Tampa Member within the lower Hawthorn Group. Non-potable ground water was encountered below 130 feet as coring continued into the more permeable carbonates of the Suwannee Limestone, with chloride concentrations in excess of 500 ppm. Chloride values at the total cored depth of 309 feet were reported to be 4300 ppm, and the highest observed chloride concentration of 5000 ppm occured at 279 ft. below land surface. No water quality analyses of sulfate concentrations were conducted on samples collected during core drilling. Upon completion of test drilling

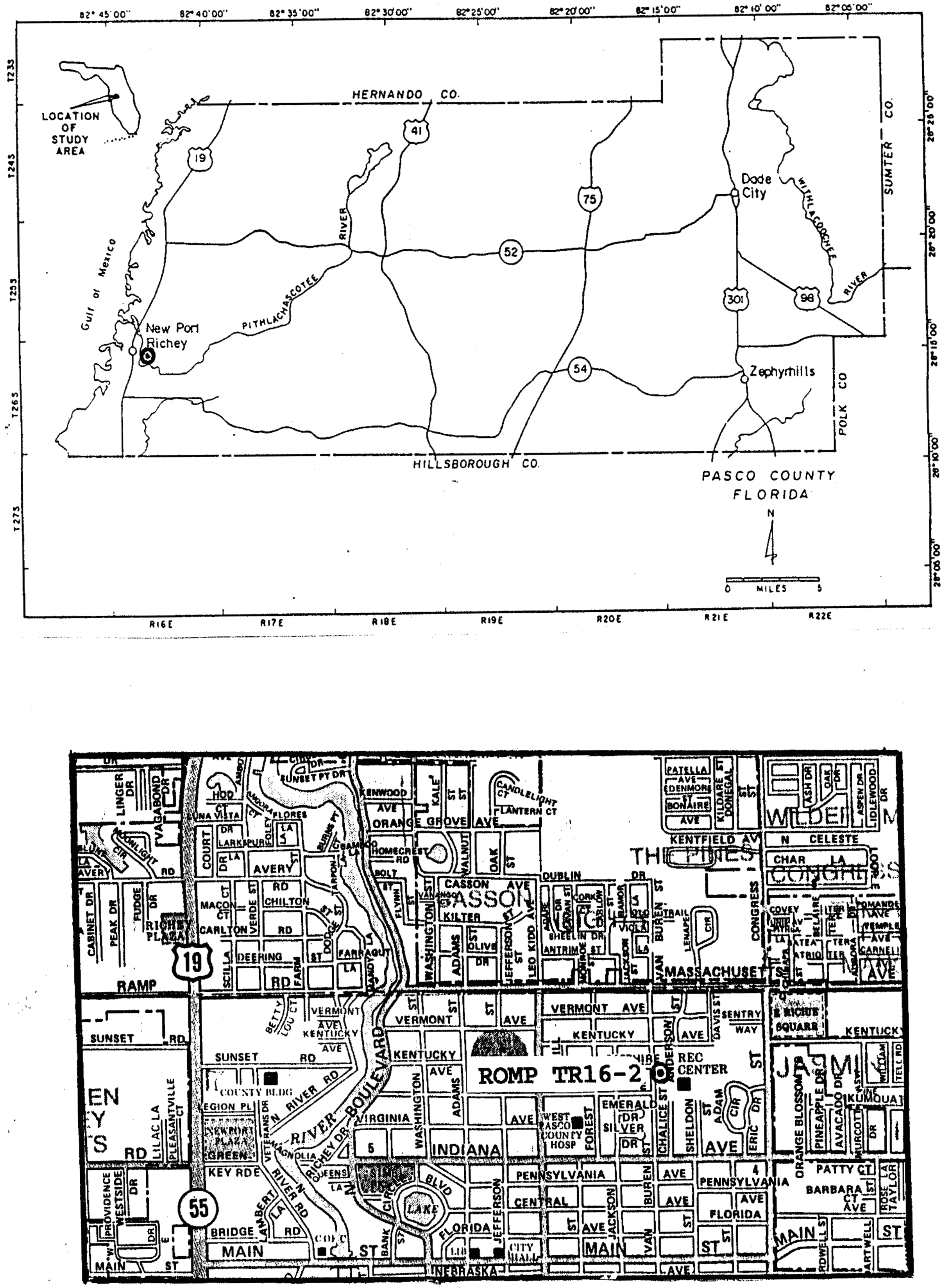

Figure 1. ROMP TR 16-2 wellsite location.

the corehole was cement-grouted back to land surface, and drilling operations at TR16-2 were suspended. There was no other activity from the ROMP at the site until 1989.

A second test core was drilled at the site in May of 1989 to obtain additional core data and a current water quality profile. The second test well began with collecting sediment samples by hollow stem auger drilling from land surface to 48 feet. Wireline core drilling continued in the augerhole, into the saturated zone of the Floridan Aquifer, and through a lost-circulation zone occurring in permeable limestone at approximately 57 feet. Core drilling in the augerhole was terminated at 69 feet, at which time the augerhole was abandoned. Core drilling resumed after a 10 inch PVC casing was set at 57 feet, and 4 inch temporary steel casing was seated at 70 feet below land surface. Test drilling was completed in this well with continuous coring between 70 feet and of 549 feet, and the collection of groundwater samples on five to ten foot intervals. A summary of geology and generalized lithologies from the test corehole is described below:

0 - 35 ft. Undifferentiated Surficial Sand and Clay Deposits (Plio-Pleistocene to Holocene): well sorted, fine grained light yellowish brown to yellow-gray quartz sand, grading to a light greenish yellow to yellow-gray clayey sand with beds of brown to dark brown, organic-rich, clayey sand; minor iron stain, organics and root fragments, and limestone pebbles; generally high porosity.

35 - 119 ft. Tampa Member, Hawthorn Group (Lower Miocene): sandy fossiliferous limestone with interbedded montmorillonite clays; white to very light orange sandy calcilutite, minor clay content and iron staining, bioturbated, vuggy with calcite intergrowths, mollusc molds and fossil fragments, moderate to high moldic porosity; clays are light olive, yellowish-gray to light gray with variable quartz sand content and iron stain, limestone fragments, low permeability.

119 - 320 ft. Suwannee Limestone (Oligocene): clean fossiliferous limestone; very light orange, yellowish gray fine grained calcarenite; chert replacement in upper part of section, minor clay laminations and organic-rich clay seams, calcite recrystallization in fossil molds, molluscs, fossil fragments, echinoids, foraminifera; Dictyoconus sp., to high porosity and permeability.

320 - 465 ft. Ocala Limestone (Upper Eocene): yellowish gray to very light orange foraminiferal limestone, fine to coarse grained interbedded calcarenite, minor thin beds of organic material, bioturbated, infilled burrow structures, mollusc molds, Pectin shells, fossil fragments, abundant foraminifera; Nummulites vanderstoki, Lepidocyclina ocalana; low to moderate intergranular and moldic porosity, low permeability.

465 - 549 ft. Avon Park Formation (Middle Eocene): yellowish-gray grayish yellow to light olive gray medium to coarse grained limestone and interbedded yellowish-brown sucrosic dolomite, dark brown lignite beds, organic laminations, abundant foraminifera; Dictyoconus americanus; bioturbated, mollusc molds, echinoids, minor vertical fractures, generally high porosity and permeability.

SITE HYDROGEOLOGY

Figure 2 shows the geologic and hydrostratigraphic boundaries of the Floridan Aquifer System, as determined from test drilling at the TR16-2 monitor wellsite. Hydrogeology in the region of the site consists of a single unconfined to semi-confined artesian aquifer system. Lithologic data indicates a thin, highly porous mantle of unsaturated sand and a relatively thin clay confining bed cover permeable limestones of the Floridan Aquifer. These geologic parameters are indicative of an aquifer system that is heavily influenced by localized recharge conditons, and that may be susceptable to sustained groundwater degradation through salt water intrusion or other forms of contamination.

Water level measurements recorded during test core drilling at the TR16-2 wellsite are indicative a semi-confined to unconfined, single aquifer system. There was no water table observed at the site when drilling through the surficial sediments. The first water level measurement in the corehole was at 34.5 feet below land surface and was observed after penetrating weathered limestone at 36.5 feet. This marked the upper extent of the Floridan Aquifer, and was coincident with the top of the Tampa Member of the Arcadia Formation. An Upper Hawthorn, or possibly Post-Miocene, sandy montmorillonite clay bed overlying the limestones of the Tampa Member (Tampa Fm.)from -32 ft. to -36.5 ft. may provide a limited degree of confinement to the Floridan Aquifer, and may also explain the apparent artesian head observed in the test hole.

Water levels remained stable as core drilling resumed to a depth of 319 feet, where a sharp decline in water level was observed. The drop in head correlated with the depth of the anomolous spike in the water quality profile, in which it appeared that groundwater conditions were in near equilibrium with seawater conditions. The water level in the corehole dropped from 34.5 feet to 42.9 feet below land surface between 289 ft. and 319 feet. Fluid conductance measured in water samples over the same interval increased from from 5700 umhos at 289 ft., 22000 umhos at 299 ft., to 40900 umhos at 319 feet below land surface (Fig. 3) Water quality remained very saline for the remaining test drilling, although water levels rebounded to between 36 ft. and 38 feet below land surface.

Water quality trends observed during the 1989 drilling were similar to the 1982 profile, but higher values of fluid conductivity and chloride content were observed from similar intervals in the two data sets. Non-potable water quality was present at 134 feet below land surface, and chloride concentrations exceeded 500 ppm. below 170 feet. Chloride values at 309 feet were reported between 7900 ppm and 8400 ppm, and ranged from 7000 ppm to 16000 ppm from 309 feet to 549 feet in the well. An anomolous spike in chloride concentration occurred at the 319 foot sampling interval, with a chloride value measured at 16000 ppm. The water quality spike is apparently related to the large solution cavity observed at 300 feet, which is just above the Suwannee-Ocala formational contact. This sharp decline in water quality marks the apparent position of the fresh-saltwater interface in the Floridan Aquifer, with saline groundwater conditions continuing in the well to the total core depth of 549 feet.

The new corehole drilled in 1989 was designated TR 16-2A in order to differentiate between this core data and data collected during core drilling in 1982. Two separate lithologic logs were generated from the two coreholes as a result of the repeat drilling, and both logs are available in the ROMP TR16-2 wellsite file.

A summary of core recovery for both coreholes is contained in Appendix 1. Poor core recovery or no core samples were common in the TR16-2A core through the lower section of Suwannee Fm. between 200 ft. and 300 ft., due to the apparent poor induration of the limestone. Core samples recovered during the first test drilling at the site were much more complete over the same section of Suwannee Formation, for reasons that are not clear. Although the same drilling rig and driller worked on both test holes, its possible that a change in drilling speed or water pressure during drilling caused the differences in core recovery through the same intervals.

A significant feature in the site stratigraphy was observed at 300 feet below land surface near the contact between the Suwannee Fm. and Ocala Formation. A cavity zone was intersected between 297 ft. and 301 feet, based on a depth from a caliper log run on the corehole. A mixture of organic-rich silt and abundant fragmented echinoid tests was recovered from the interval when pumping the cuttings from the well. The cavity zone appeared to be a solution feature that may have developed at the formation contact where a contrast in rock competency exists, and the silt and echinoid fragments may represent a residium from the dissolved limestone. The feature apparently is subject to active groundwater flow, with a significant change in groundwater quality characteristics observed at this point in the corehole.

GEOLOGIC UNIT	DEPTH (ft)	HYDROSTRATIGRAPHIC UNIT
Surficial Deposits	0	Semi-confiner
Tampa Mbr., Arcadia Fm. Hawthorn Group	100	
Suwannee Limestone	200	Floridan
	300	Aquifer
Ocala Limestone	400	System
Avon Park Formation	500	
	549 T.D.	

Figure 2. Generalized hydrostratigraphy at ROMP TR16-2.

A comparison of water quality data obtained from the 1982 and 1989 test coreholes is presented in Figure 3. Although the first core at TR16-2 was drilled to 309 feet, there was no outward evidence of a solution cavity at the 300 foot interval. A decline in water quality is present at 279 ft, and again at the total depth of 309 feet suggesting an influence from the same cavity zone that was observed in the second corehole. Still water quality conditions in the first test hole were considerably fresher at similar depths, suggesting that a regional decline in groudwater quality may have occurred in the area, due to overdevelopment of the resource for municipal water supply demands.

Test core drilling was terminated at 549 feet after penetrating crystalline dolostone in the Avon Park Formation. A full suite of geophysical logs was run on the corehole that included caliper, gamma ray, fluid temperature, conductivity, electric, gamma-gamma density, and nuetron porosity logs. The corehole was then cement-plugged back to a depth of 486 feet to be reamed out at a later date to accomplish monitor well construction. Geophysical log data from the TR16-2A corehole is available in the ROMP wellsite file.

Before leaving the site the drill rig was set up over the existing abandoned supply well to conduct plugging procedures. The abandoned well was in extremely poor condition, and previous attempts to log the well were unsuccessful, due to obstructions in the well and a severely deteriorated steel casing. The well was plugged by pumping cement grout through tremie pipe set at 136 feet below land surface. This was apparently still up inside the the 10 inch steel casing, reported to be at 200 feet, but the poor condition of the casing made it impossible to set the tremie deeper in the well. Five stages of grout totalling 900 gallons were pumped in the well, (74 sacks cement mixed with 4 bags of bentonite) which was topped off with 20 bags of silica sand before tagging the plug at a depth of approximately 110 feet. An additional 200 gallons of grout was used for a total of 95 sacks of grout to plug the well.

UNIVERSITY RESEARCH

The TR16-2 drilling work included a cooperative research program between the ROMP staff and academic staff from universities in Florida and Virginia. Detailed lithologic and geochemical analyses of core and groundwater samples from the site were performed in a joint research effort between Professor Tony Randazzo of the University of Florida, Gainsville, and Professor Janet Herman from the University of Virginia in Charlottesville. Comprehensive data sets generated by graduate student researchers under the direction of the two professors are included in the Appendix 2. The primary focus of their work was to develop a theoretical model of the geochemical thermodynamics in a carbonate groundwater system influenced by a fresh-saltwater interface. Relationships between mineral phase equilibria observed in the rock core, and results from detailed chemical analyses of water samples collected from the corehole, were used to compare theoretical predictions with observed rock-water geochemical interactions. Data sets produced from this research include a complete water quality analysis, and porosity and X-ray diffraction data from selected core samples.

CORE:	TR16-2: DRILLED 1/82			TR16-2A: DRILLED 5/89		
DEPTH (ft)	WL (ft)	COND (umhos)	Cl (ppm)	WL (ft)	COND (umhos)	Cl (ppm)
43	-----	-----	-----	-34.5	295	10
49	-----	-----	-----	-34.9	385	-----
52	-33.7	440	63	-----	-----	-----
54	-----	-----	-----	-34.7	415	25
59	-----	415	44	-34.6	475	-----
64	-----	-----	-----	-----	525	47
69	-33.7	390	42	-----	525	49
79	-----	450	58	-----	480	44
84	-----	-----	-----	-34.4	520	48
89	-33.3	950	240	-----	575	73
94	-----	-----	-----	-----	725	123
99	-----	900	200	-----	750	138
104	-----	-----	-----	-----	1010	239
109	-----	650	120	-----	900	191
114	-----	-----	-----	-34.5	820	190
119	-33.2	650	145	-----	850	185
124	-----	-----	-----	-----	820	-----
129	-33.2	1950	520	-----	840	210
134	-----	-----	-----	-----	1270	370
139	-----	2500	820	-----	1475	400
144	-----	-----	-----	-----	1550	460
149	-33.0	3200	1150	-34.6	1880	600
154	-----	-----	-----	-----	1880	580
159	-----	3300	1250	-----	1850	560
169	-33.3	3200	1100	-----	2610	800
179	-----	4200	1400	-----	4190	1310
184	-----	-----	-----	-----	5100	1670
189	-----	2500	780	-----	4300	1260
199	-33.3	1900	600	-----	4400	1530
209	-----	2000	640	-----	4310	1330
219	-----	2600	940	-----	3990	1430
229	-33.3	2400	780	-34.5	4210	1280
239	-----	3200	1150	-----	4190	1340
249	-----	2400	780	-----	3910	1200
259	-----	2400	780	-----	3490	1040
269	-33.3	3500	1250	-34.5	3990	1490
279	-----	11500	5000	-----	3600	1040
284	-----	-----	-----	-----	3990	1200
289	-----	8000	3600	-34.5	5700	1730
294	-----	-----	-----	-----	5300	1670
299	-33.7	6000	2200	-----	22000	8000
304	-----	-----	-----	-----	21500	6860
309	-----	10500	4300	-----	22600	8000
314				-----	22700	7350
319	TOTAL DEPTH 309 ft.			-42.9	40900	16670
324				-----	23200	8320
329				-37.2	25300	10500
334				-----	22100	8230
339				-----	20600	7500
344				-----	23500	8570
349				-----	23200	8570
359				-----	24600	9640
364				-36.3	23900	-----
369				-----	20200	8300
379				-----	19000	7250
389				-----	20200	7860
399				-----	19600	7500
409				-----	23200	9290
419				-----	26300	10830
424				37.0	30700	12500
429				-----	27200	10420
434				-----	31900	13500
439				-----	32800	12080
444				-----	28400	11000
454				-----	34900	14000
464				-36.8	31300	12500
474				-38.1	37700	14000
484				-----	33500	12400
494				-----	32900	12400
504				-----	35900	13300
514				-36.9	37700	12920
524				-----	38900	15000
534				-----	35900	13300
544				36.0	31700	11900
549				-----	32500	-----

Figure 3. Water quality comparison of 1982 and 1989 corehole data.

MONITOR WELL CONSTRUCTION

Based on the results of groundwater sampling and core analysis at TR16-2, a triple zone, nested monitor well was constructed to target specific intervals in the Floridan Aquifer. A diagram of the nested monitor well is shown in Figure 4. The completed screened intervals in the well were placed to monitor significant increases in groundwater salinity with depth and generally corresponded with zones above the mixing zone, in the mixing zone, and below the interface.

Construction of the triple zone well was accomplished by reaming out the existing corehole with a 9.5 inch bit to a depth of 486 feet and installing three 2 inch well casings, with each well having 30 feet of 20-slot, 2 inch diameter PVC screen. The screened intervals were packed with 6/20 grade silica sand and capped with approximately 5 feet of bentonite pellets. Cement grout was pumped through tremie pipe between each monitor zone, and the well was completed by cement grouting the annular space to land surface.

The final configuration of this experimental well design was not particularly encouraging, for a number of reasons. First, the middle screened interval was placed between 340 feet and 380 feet, which was below the water quality anomoly and solution cavity at the 300 to 320 foot interval. This screen completion was intended to monitor a specific water quality interval below the anomoly, with the intent of avoiding any influence from the cavity zone and associated anomoly. Water quality results from the middle zone well after completion compared exactly with the anomoly data, and represent the most saline zone of the three wells in the nested monitor.

A probable explanation for this occurrence is that an incompetent bentonite and grout seal exists in the 20 foot interval separating the middle screen zone from the water quality anomoly. A direct channel through the grout seal along the monitor tubes may have formed as the cement cured, which would result in a conduit connecting the monitor screen with the cavity zone. Also, the presence of high salinity water in the well at this zone may have interfered with the cement curing reaction, resulting in an incompetent grout seal. Both water level and water quality measurements in the completed middle zone correlate with data collected during core drilling at points 20 feet to 40 feet above the monitor zone.

A serious problem also was discovered in the upper monitor zone of the nested well after completion of the triple zone monitor. An apparent failure in the well casing or screen was found when the well depths were being confirmed. The well screen appeared to be filled with silica sand and bentonite pellets from the screen bottom of 230 feet to 205 feet. The well also produced cloudy water when being developed, and the water clarity never improved with continued pumping. Water samples collected from this zone several months after the problem was detected also exibited the cloudy water conditions, which appeared to be coming from the bentonite cap above the sandpack from 190 feet to 195 feet. Numerous attempts to purge the well until water clarity improved were unsuccessful.

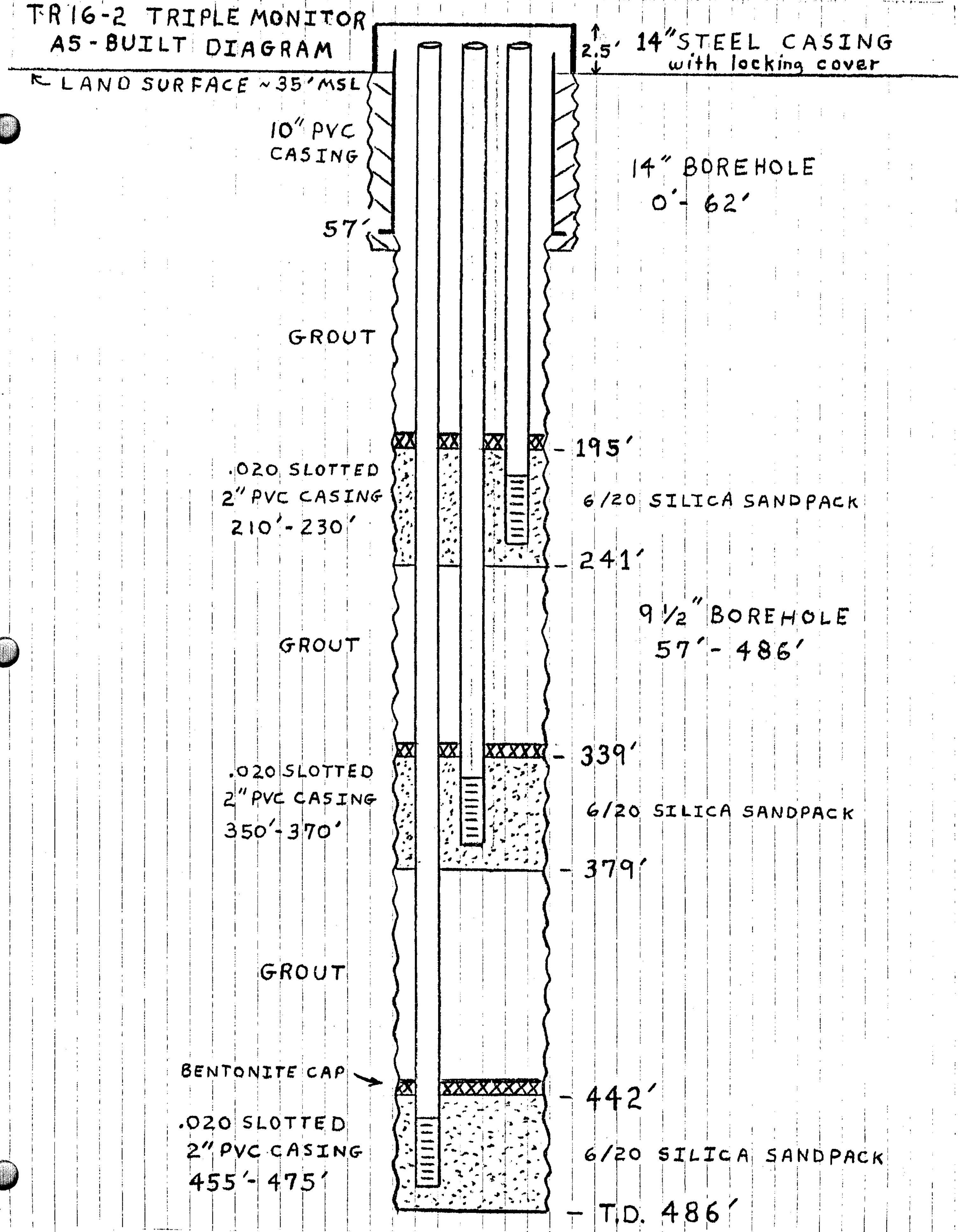

Figure 4. As-built diagram of triple zone Floridan aquifer water quality monitors.

The probable explanation for the well failure was that insufficient space existed in the 9.5 inch hole to install three 2 inch diameter monitor tubes, and the last tube to be installed was apparently forced into the well by the driller. Either the casing or screen collapsed from exessive downward force being applied to the tube in an attempt to place the well screen at the specified depth.

A separate monitor well was also constructed at TR16-2 to monitor seasonal water level fluctuations in the Floridan Aquifer. The well was originally designed as a 6 inch diameter PVC monitor, cased to 70 feet and with open hole in the Tampa Formation from 70 feet to 90 feet. Problems during construction of this well significantly changed the final completion, which is depicted in Figure 5.

Problems in the drilling of the Tampa Fm. monitor began when the initial wellbore was unable to be drilled deeper than 60 feet. As mentioned before, lost circulation conditions were encountered at a depth of 57 feet, and the formation at this depth did not produce sufficient volumes of water to continue by reverse-air drilling methods. The 6 inch PVC casing was set at 59 feet, and the well was completed to a total depth of 91 feet. Upon completion of the well, a hole in the 6 inch casing was discovered at a depth of 36 feet, and groundwater was draining into the well from the surrounding formation.
The well was repaired by setting a 3 inch diameter PVC screen and silica sandpack in the existing open hole from 68 feet to 88 feet, and continuing with 3 inch PVC casing up inside the 6 inch casing to 44 feet below land surface. The 6 inch casing was then lined with 4 inch diameter PVC casing, and completed by pumping cement grout through a collapsable hose from approximately 65 feet to land surface. The 4 inch liner would provide adequate space for a conventional float-type water level recorder, and ample grout thickness was present in the annular space between the 3 inch and 6 inch casing to effectively seal the well above the screen.

SITE COMPLETION

Drilling and subsequent well repair was completed at TR16-2 in February of 1990. The site is currently being monitored for water quality by the District staff, and sampling of all monitors at site will be conducted by the University of Virginia research staff in January of 1991. A comparison of water quality data collected during core drilling will be compared with sample results from the completed monitors to determine possible effects of the drilling process on sample collection and observed data trends.

An updated survey of the wellsite is forthcoming from the District Land Surveying staff, and all data necessary to outfit the wellsite with data recording devices has been forwarded to the District's Data Collection section.

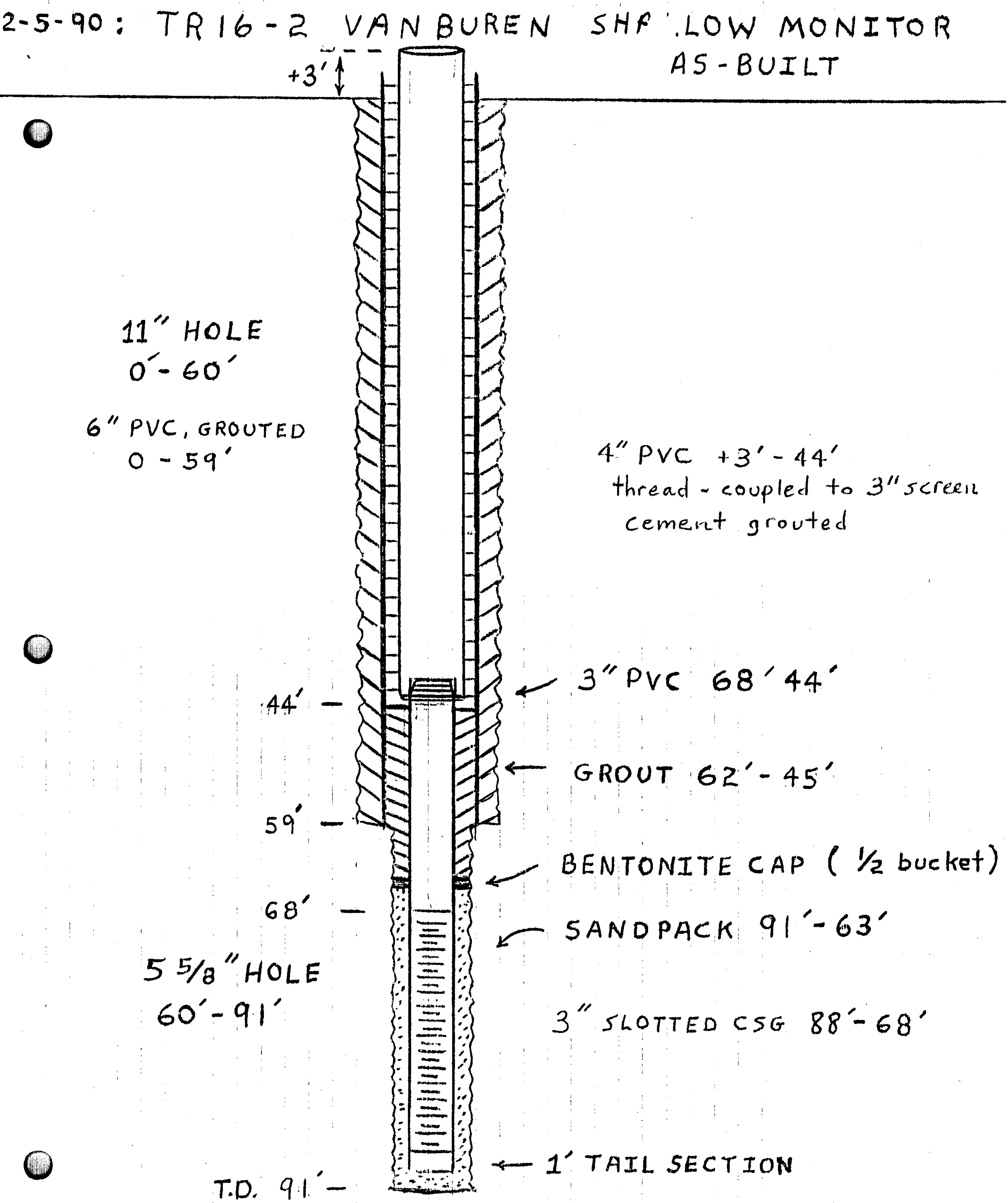

Figure 5. As-built diagram of Tampa Fm./ Floridan aquifer potentiometric monitor.

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Southwest Florida Water Management District, 1988; Ground-Water Resource Availability Inventory, Pasco County, Florida.

SWFWMD ROMP TR16-2 Wellsite File, 1982.

APPENDIX 1. Percentage of Core Recovery from Corehole TR 16-2A.

ROMP TR16-2A VAN BUREN WELLSITE

Core Interval - Recovery Data

- hollow stem auger drilling, 0 '- 49.0 '
- wireline rotory core drilling, 49.0 '- 549.0 '

DATE	CORE RUN (ft)	% RECOVERY	COMMENT
4-17-89	0.0 - 3.0	---	-bag samples collected
	3.0 - 4.0	100	with posthole digger
	4.0 - 6.5	80	
	6.5 - 9.0	84	
	9.0 - 11.5	84	
	11.5 - 14.0	84	
	14.0 - 16.5	100	
	16.5 - 19.0	88	
	19.0 - 24.0	50	
	24.0 - 26.5	92	
	26.5 - 29.0	100	-damp sediment
	29.0 - 31.5	100	
	31.5 - 34.0	96	-wet @ 32.0 '
	34.0 - 36.5	100	
	36.5 - 39.0	80	-top of Tampa Fm.
4-18-89	39.0 - 41.5	100	
	41.5 - 44.0	68	-first water level
	44.0 - 46.5	88	measured; -34.5 '
	46.5 - 49.0	68	
	49.0 - 54.0	74	-begin wireline coring
4-19-89	54.0 - 59.0	40	water level; -34.9 '
	59.0 - 64.0	70	
	64.0 - 69.0	96	
4-25-89	----	---	-ream corehole 9.5" dia
	----	---	to 62.0 ', set 10" PVC
4-27-89	----	---	-ream corehole 7.5" dia
	69.0 - 74.0	48	62.0'-69.0',set 4" stl
	74.0 - 79.0	42	
5-1-89	79.0 - 84.0	40	-Herman / Wicks begin
	84.0 - 89.0	48	collecting samples
	89.0 - 94.0	56	
	94.0 - 99.0	78	
5-2-89	99.0 - 104.0	38	
	104.0 - 109.0	40	
	109.0 - 114.0	32	
	114.0 - 119.0	38	
	119.0 - 124.0	0	-top of Suwannee Fm.
	124.0 - 129.0	32	
	129.0 - 134.0	26	
	134.0 - 139.0	78	
	139.0 - 144.0	20	
	144.0 - 149.0	22	
5-4-89	149.0 - 154.0	0	
	154.0 - 159.0	16	
	159.0 - 164.0	22	

DATE	CORE RUN (ft)	% RECOVERY	COMMENT
	164.0 - 169.0	10	
	169.0 - 174.0	56	
	174.0 - 179.0	36	
	179.0 - 184.0	54	
	184.0 - 189.0	42	
5-5-89	189.0 - 194.0	84	
	194.0 - 199.0	36	
	199.0 - 204.0	68	
	204.0 - 209.0	16	
	209.0 - 214.0	0	-cuttings collected
	214.0 - 219.0	54	
	219.0 - 224.0	56	
	224.0 - 229.0	0	-cuttings collected
5-6-89	229.0 - 234.0	11	
	234.0 - 239.0	0	-cuttings collected
	239.0 - 244.0	13	
	244.0 - 249.0	0	-cuttings collected
	249.0 - 254.0	42	
	254.0 - 259.0	20	
5-7-89	259.0 - 264.0	24	
	264.0 - 269.0	32	
	269.0 - 274.0	4	-cuttings collected
	274.0 - 279.0	14	
	279.0 - 284.0	18	
	284.0 - 289.0	72	
5-8-89	289.0 - 294.0	20	
	294.0 - 299.0	0	-cuttings collected
	299.0 - 304.0	52	
	304.0 - 309.0	62	
	309.0 - 314.0	76	
	314.0 - 319.0	32	
5-9-89	319.0 - 324.0	42	-top of Ocala Fm.
	324.0 - 329.0	82	
	329.0 - 334.0	84	
	334.0 - 339.0	32	
	339.0 - 344.0	94	
	344.0 - 349.0	70	
	349.0 - 354.0	92	
	354.0 - 359.0	62	
	359.0 - 364.0	82	
	364.0 - 369.0	70	
	369.0 - 374.0	78	
	374.0 - 379.0	88	
	379.0 - 384.0	76	
	384.0 - 389.0	69	
	389.0 - 394.0	45	
	394.0 - 399.0	56	
	399.0 - 404.0	77	
	404.0 - 409.0	53	
	409.0 - 414.0	73	
	414.0 - 419.0	75	
	419.0 - 424.0	70	
5-11-89	424.0 - 429.0	96	
	429.0 - 434.0	76	

DATE	CORE RUN (ft)	% RECOVERY	COMMENT
	434.0 - 439.0	100	
	439.0 - 444.0	64	
	444.0 - 449.0	100	
	449.0 - 454.0	86	
	454.0 - 459.0	100	
	459.0 - 464.0	100	-top of Avon Park Fm.
	464.0 - 469.0	100	
	469.0 - 474.0	100	
5-12-89	474.0 - 479.0	100	
	479.0 - 484.0	100	
	484.0 - 489.0	100	
	489.0 - 494.0	100	
	494.0 - 499.0	98	
	499.0 - 505.0	100	
	505.0 - 509.0	100	
	509.0 - 514.0	100	
5-13-89	514.0 - 519.0	96	
	519.0 - 524.0	97	
	524.0 - 529.0	100	
	529.0 - 534.0	89	
	534.0 - 539.0	86	
	539.0 - 544.0	87	
5-14-89	544.0 - 549.0	100	

TOTAL DEPTH 549.0 FT.

APPENDIX 2

ROMP TR 16-2

Additional Wellsite Corehole Data from the University of Virginia Department of Environmental Sciences and the University of Florida Geology Department

Herman / Wicker
Univ. of Virginia

TR16-2A, New Port Richey, FL, May 1989:
Preliminary report of groundwater composition
Dated: Sept 15, 1989

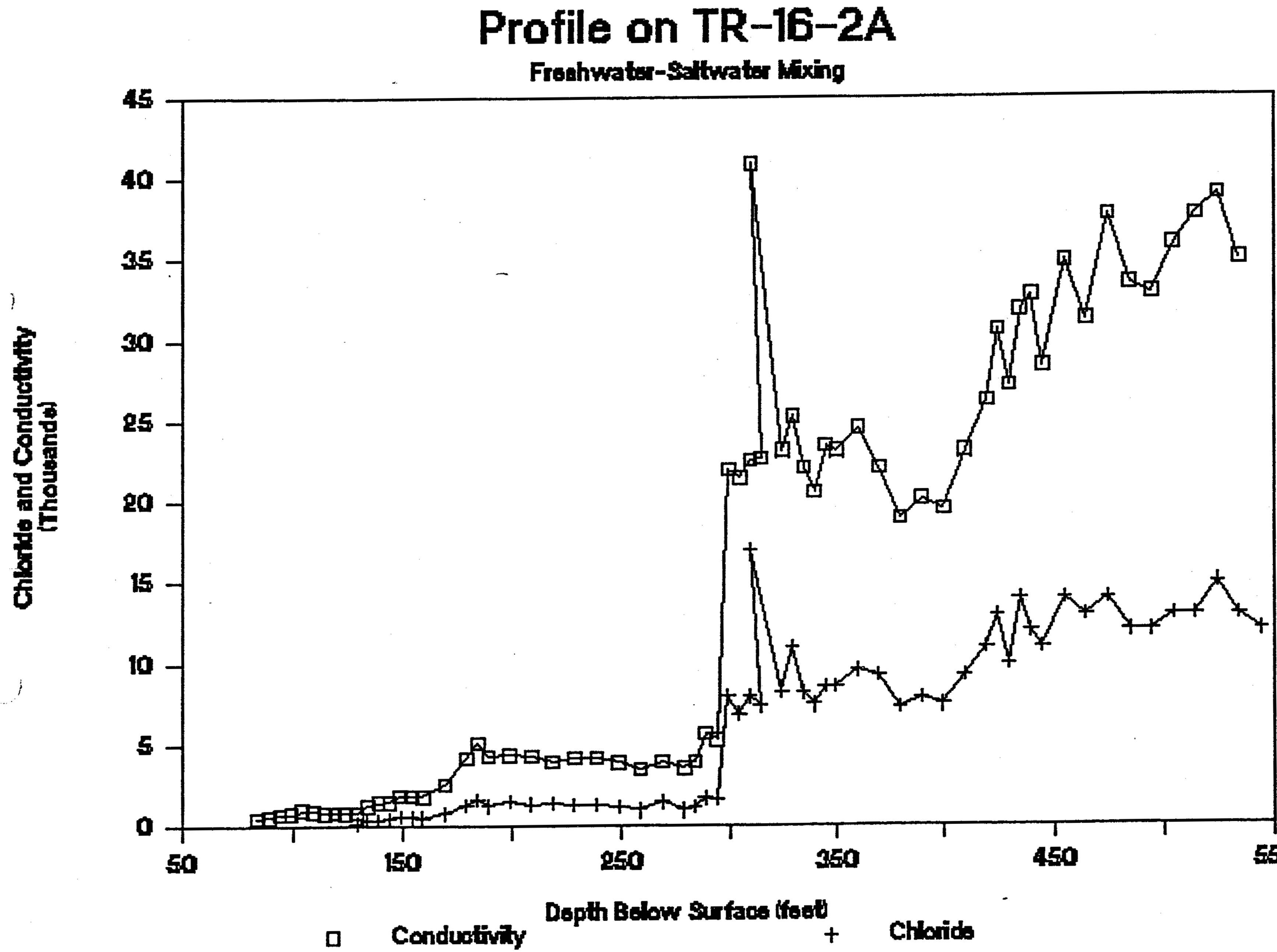
	Depth (feet)	pH	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	SO4 (mg/L)	HCO3 (mg/L)	charge balance (%)	ionic strength (molal)
1	84	7.72	34.71	66.25	8.08	4.33	44.17	31.23	216	1.47	0.0078
2	89	7.86	45.49	66.01	9.19	3.11	64.77	33.03	202	2.44	0.0083
3	94	7.73	67.90	67.43	11.29	3.65	112.67	41.67	229	-2.96	0.0101
4	99	7.53	71.59	70.30	11.80	3.58	129.00	42.77	260	-6.65	0.0109
5	104	7.49	105.22	79.19	15.89	4.12	230.00	54.67	191	-3.88	0.0135
6	109	7.50	92.11	80.21	14.09	4.06	182.00	49.27	198	-0.65	0.0124
7	114	7.55	89.71	76.12	13.49	3.65	170.00	48.97	201	-1.08	0.0119
8	119	7.50	86.43	73.01	12.71	3.82	159.00	48.77	219	-3.02	0.0116
9	124	7.53	91.77	62.50	12.68	3.85	154.67	50.07	203	-2.77	0.0110
10	129	7.52	95.55	68.07	13.93	4.23	168.67	51.27	200	-1.59	0.0117
11	134	7.52	178.24	69.02	20.65	4.27	258.67	68.93	201	5.90	0.0157
12	139	7.53	198.69	71.39	22.71	4.29	300.67	76.13	202	2.99	0.0172
13	144	7.54	213.34	74.43	22.88	4.70	334.00	81.27	205	1.84	0.0183
14	149	7.52	268.64	81.80	31.60	6.15	481.00	102.67	205	-1.38	0.0231
15	154	7.42	271.79	86.26	32.41	6.42	477.67	100.90	196	0.51	0.0233
16	159	7.51	254.66	91.67	31.13	6.22	467.00	99.33	205	-0.56	0.0230
17	169	7.58	395.33	96.19	46.64	8.21	697.33	117.00	202	1.28	0.0311
18	179	7.44	605.76	117.22	72.10	12.68	1180.00	190.33	202	-2.60	0.0472
19	184	7.45	801.57	140.88	92.61	15.41	1516.67	220.00	200	-0.66	0.0597
20	189	7.42	662.59	129.99	78.28	12.98	1233.33	192.67	194	0.18	0.0503
21	199	7.48	667.04	129.86	78.35	12.78	1253.33	191.33	194	-0.23	0.0507
22	209	7.48	693.91	130.91	77.47	13.05	1260.00	190.67	196	0.87	0.0513
23	219	7.48	640.51	119.15	68.68	12.44	1130.00	170.33	189	1.67	0.0465
24	229	7.50	668.06	131.18	79.33	13.52	1296.67	189.67	203	-1.53	0.0515
25	239	7.48	629.55	123.47	72.47	12.00	1193.33	179.33	203	1.33	0.0480
26	249	7.49	603.36	123.03	70.10	11.90	1126.67	171.33	203	-0.22	0.0461
27	259	7.48	508.30	112.22	87.47	10.28	940.67	154.00	197	3.29	0.0419
28	269	7.48	616.20	118.64	70.91	12.68	1170.00	173.00	189	-0.98	0.0468
29	279	7.48	495.18	110.42	62.46	10.82	1010.00	158.00	193	-3.61	0.0405
30	284	7.50	627.33	119.89	72.50	13.11	1130.00	175.67	194	1.16	0.0468
31	289	7.52	954.25	135.57	108.13	20.82	1723.33	226.67	190	1.16	0.0670
32	294	7.52	824.34	127.29	96.40	20.69	1570.00	214.67	192	-1.14	0.0604
33	299	7.40	4007.09	400.45	488.65	108.98	7653.33	1162.16	219	-1.27	0.2811
34	304	7.31	4129.45	297.04	484.43	105.94	7325.33	1147.31	218	0.68	0.2733
35	309	7.34	4316.84	316.14	508.25	113.55	7940.33	1195.58	219	-0.77	0.2900
36	314	7.35	4364.76	310.73	512.64	113.88	7967.67	1225.28	224	-0.63	0.2922
37	319	7.22	7399.81	500.99	1006.03	225.23	15033.33	2198.08	263	-4.19	0.5284
38	324	7.35	4402.41	377.81	517.04	112.36	8254.67	1232.70	232	-1.20	0.3010
39	329	7.32	4822.54	341.99	585.81	126.05	8678.33	1325.53	227	0.45	0.3218
40	334	7.35	4193.62	312.08	489.33	109.66	7667.00	1132.45	235	-0.48	0.2805

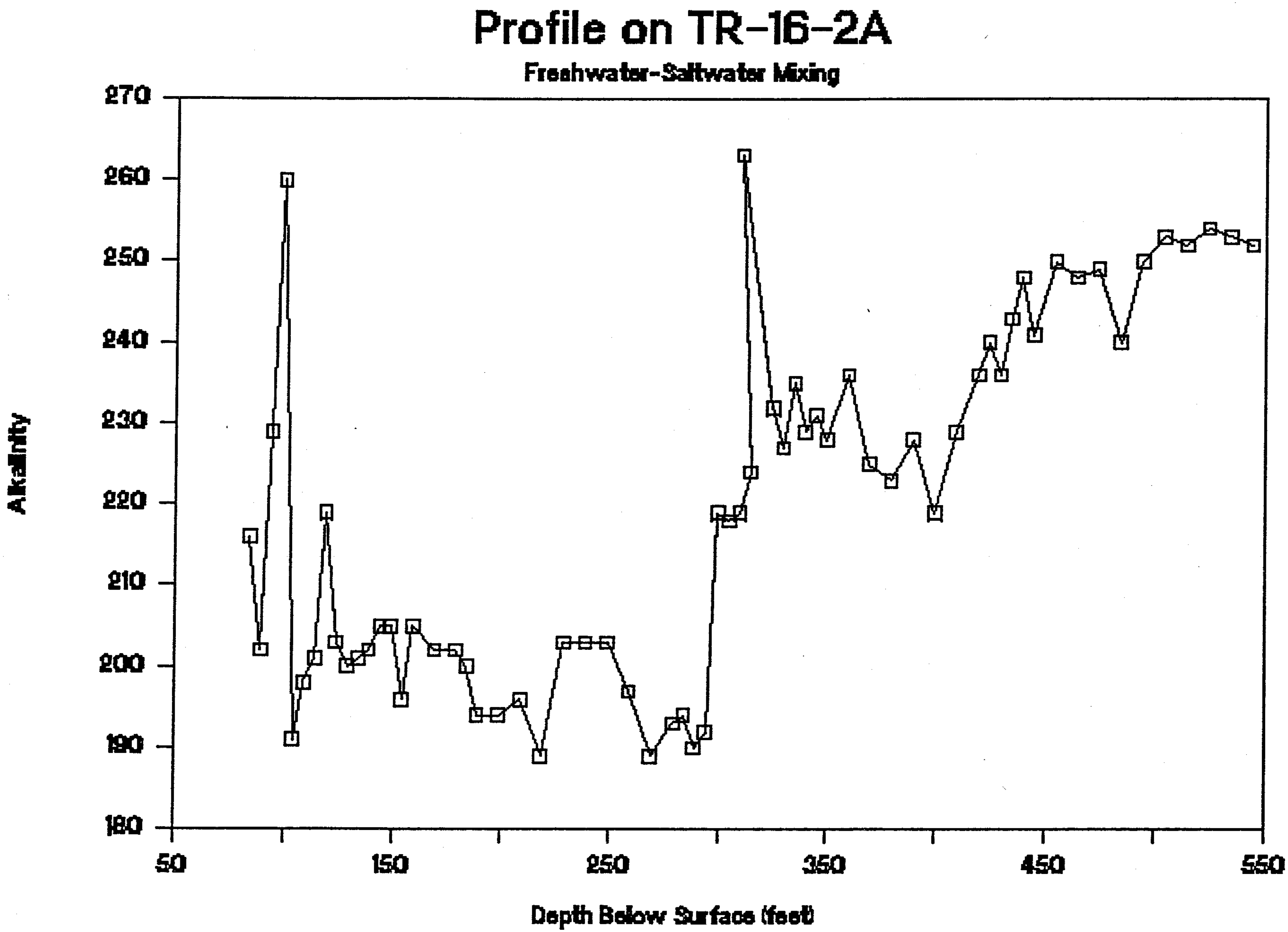
TR16-2A, New Port Richey, FL, May 1989:

Preliminary report of groundwater composition

Dated: Sept 15, 1989

	Depth (feet)	pH	Na (mg/L)	Ca (mg/L)	Mg (mg/L)	K (mg/L)	Cl (mg/L)	SO4 (mg/L)	HCO3 (mg/L)	charge balance (%)	ionic strength (molal)
41	339	7.34	4037.89	370.37	468.38	103.41	7038.33	1095.70	229	2.28	0.2687
42	344	7.34	4563.27	331.01	532.25	116.25	8268.33	1280.97	231	-0.30	0.3046
43	349	7.33	4593.22	324.92	535.46	118.78	8405.00	1284.69	228	-0.78	0.3072
44	359	7.30	4858.48	320.53	588.34	124.19	8787.67	1355.23	236	-0.13	0.3240
45	369	7.30	4359.62	309.38	505.21	111.35	7667.00	1191.86	225	1.02	0.2865
46	379	7.35	4020.78	323.57	469.39	105.10	7134.00	1093.10	223	1.08	0.2673
47	389	7.33	4031.90	284.03	462.63	99.86	7503.00	1128.74	228	-1.79	0.2710
48	399	7.40	4043.02	298.73	458.91	99.86	7216.00	1115.00	219	0.22	0.2672
49	409	7.31	4668.52	360.74	574.32	121.49	8227.33	1318.10	229	1.59	0.3120
50	419	7.31	5408.67	377.30	643.93	140.24	9413.20	1529.74	236	1.60	0.3558
51	424	7.27	6540.72	453.68	772.68	167.11	11244.67	1771.09	240	2.38	0.4257
52	429	7.42	5418.08	364.97	661.17	142.78	10096.63	1607.71	236	-1.55	0.3681
53	434	7.30	6843.62	431.71	819.66	179.44	11446.67	1819.35	243	3.57	0.4389
54	439	7.30	6989.09	445.23	834.19	182.32	11985.33	1852.77	248	2.47	0.4523
55	444	7.30	5928.06	406.36	697.16	151.39	9621.93	1615.14	241	4.75	0.3777
56	454	7.28	7463.12	479.36	888.43	196.51	12928.00	1949.31	250	2.13	0.4841
57	464	7.37	6669.07	448.94	809.52	175.22	10941.67	1767.37	248	4.71	0.4270
58	474	7.25	7909.78	516.87	979.50	213.07	14207.33	2116.39	249	0.84	0.5246
59	484	7.21	6550.98	436.61	782.48	174.54	11850.67	1774.80	240	0.12	0.4345
60	494	7.33	7867.00	467.02	824.22	214.25	12524.00	1811.93	250	5.30	0.4784
61	504	7.27	7221.83	488.31	872.37	187.89	11648.67	1930.74	253	5.41	0.4596
62	514	7.29	7442.59	478.01	951.96	208.67	13062.67	2016.14	252	2.03	0.4921
63	524	7.32	7990.22	494.23	993.02	220.33	14476.67	2120.10	254	0.38	0.5303
64	534	7.35	6951.44	460.60	861.56	183.50	12187.33	1915.89	253	1.73	0.4587
65	544	7.35	6362.74	428.16	782.15	168.63	11413.00	1771.09	252	0.59	0.4238
66	Gulf	8.17	8036.42	372.06	1054.86	232.16	15621.33	2068.12	191	-2.68	0.5448
67	Tank	7.54	12.30	85.48	6.62	85.48	16.93	19.57	256	19.50	0.0078


Profile on TR-16-2A
Freshwater-Saltwater Mixing
Chloride and Conductivity
(Thousands)
45
40
35
30
25
20
15
10
5
0
50
150
250
350
450
550
Depth Below Surface (feet)
Conductivity
Chloride


Profile on TR-16-2A
Freshwater-Saltwater Mixing
Alkalinity
270
260
250
240
230
220
210
200
190
180
50
150
250
350
450
550
Depth Below Surface (feet)

U. of Fl. Data

Porosity and Permeability Analyses Results

Wells TR16-2 and TR16-2A, combined; * Denotes TR16-2.

Sample Depth (feet below land surface)	Porosity n (%)	Hydraulic Conductivity, K_h (cm/sec)
90.5	28.982	6.4×10^{-6}
136	38.772	7.6×10^{-6}
169.5*	25.466	3×10^{-7}
193	26.721	6×10^{-7}
214	30.723	3.6×10^{-6}
224.5*	42.826	7.1×10^{-6}
250.5	16.874	2×10^{-7}
261.5*	29.786	1.1×10^{-6}
279*	39.758	1.68×10^{-5}
300	34.13	2.0×10^{-6}
309.5	19.63	5×10^{-7}
362	25.58	3×10^{-7}
370	37.91	2.24×10^{-5}
378	31.133	6.0×10^{-6}
400	34.11	2.55×10^{-5}
414	32.762	6.7×10^{-6}
422	36.62	1.22×10^{-5}
448	37.1	1.77×10^{-5}
465.5	19.14	5×10^{-7}
477	31.534	3.45×10^{-5}
487	38.07	3.30×10^{-5}
512	38.433	1.38×10^{-5}
527.8	20.59	4×10^{-7}
542	11.31	6×10^{-7}
548.5	23.305	9.8×10^{-6}

U. of Fl. Data

TR16-2A

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)	Microfacies Number and Name		XRD Mineralogy (in decreasing abundance)
1) 55	6	Quartz-rich packstone	calcite, quartz
2) 59	4	Foraminiferal wackestone	calcite, quartz
3) 71	4	Foraminiferal wackestone	calcite, quartz
4) 74	4	Foraminiferal wckstone/mdstone	calcite, quartz
5) 80	4	Foraminiferal wackestone	calcite
6) 90	2	Bioclastic grainstone	calcite, quartz
7) 96	6	Bioclastic packstone	calcite
8) 100.5	4	Wackestone	calcite
9) 115	8	Rudaceous wackestone	calcite
10) 125	4	Silicified miliolid wackestone	No XRD
11) 129	4	Silicified foraminiferal wckstn	calcite
12) 138	4	Bioclastic wackestone/mudstone	calcite
13) 145	4	Foraminiferal wackestone	calcite
14) 170	3	Miliolid grainstone	calcite
15) 181	4	Bioclastic wackestone	calcite
16) 186	6	Bioclastic packstone	calcite
17) 202	6	Bioclastic packstone	calcite, quartz
18) 204.5	4	Wackestone	calcite, quartz
19) 210	4	Wackestone	calcite, quartz
20) 215	6	Bioclastic packstone	calcite
21) 216	6	Foraminiferal packstone	calcite, quartz
22) 250	5	Dolomitic packstone	dolomite

TR16-2A

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)	Microfacies Number and Name		XRD Mineralogy (in decreasing abundance)
23) 264.5	2	Foraminiferal grainstone	calcite
24) 274.5	6	Bioclastic pckstone/wckstone	calcite
25) 287.5	4	Bioclastic Wackestone	calcite
26) 300	2	Bioclastic wackestone	calcite
27) 310.5	2	Foraminiferal grainstone	calcite, quartz
28) 311	4	Bioclastic wackestone	calcite
29) 313	4	Bioclastic wackestone	calcite
30) 314.5	6	Miliolid Packstone	calcite
31) 315	4	Bioclastic wackestone	calcite
32) 315.5	4	Bioclastic wackestone	calcite
33) 327	6	Foraminiferal packstone	calcite
34) 351	7	Nummulitic wackestone	calcite
35) 363	7	Nummulitic wackestone	calcite
36) 369	7	Nummulitic wackestone	calcite
37) 375	7	Nummulitic wackestone	calcite
38) 382	6	Foraminiferal packstone	calcite
39) 385	6	Miliolid packstone	calcite
40) 397	7	Nummulitic wackestone	calcite
41) 411	7	Nummulitic wackestone	calcite
42) 415	7	Nummulitic wackestone	calcite
43) 420	7	Nummulitic wackestone	calcite
44) 426	7	Nummulitic wckstone/pckstone	calcite

TR16-2A

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)	Microfacies Number and Name		XRD Mineralogy (in decreasing abundance)
45) 428.5	6	Foraminiferal packstone	calcite
46) 431	6	Miliolid packstone	calcite
47) 441.5	6	Miliolid packstone	calcite
48) 452	6	Foraminiferal packstone	calcite
49) 459	6	Foraminiferal packstone	calcite
50) 459.5	6	Foraminiferal pckstn/wckstn	calcite
51) 461.5	2	Foraminiferal grainstone	calcite
52) 464	2	Foraminiferal grainstone	calcite
53) 465	4	Foraminiferal wackestone	calcite
54) 466	4	Foraminiferal wackestone	calcite
55) 467.5	3	Miliolid grainstone	calcite
56) 475	6	Foraminiferal packstone	calcite
57) 479	3	Foraminiferal pckstn/grnstn	calcite
58) 480	6	Foraminiferal packstone	calcite
59) 496	6	Foraminiferal packstone	calcite
60) 497.5	2	Foraminiferal grainstone	calcite
61) 500	2	Foraminiferal grainstone	calcite
62) 507	2	Foraminiferal grainstone	calcite
63) 516	2	Foraminiferal grainstone	calcite
64) 517.5	3	Miliolid grainstone	calcite, quartz
65) 521.5	3	Miliolid grainstone	calcite
66) 527	1	Dolomitic grainstone	calcite, dolomite

TR16-2A

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)	Microfacies Number and Name		XRD Mineralogy (in decreasing abundance)
67) 528	5	Dolomitic packstone	calcite, dolomite
68) 534	9	Crystalline dolomite	dolomite, calcite
69) 537	1	Dolomitic grainstone	dolomite, calcite
70) 541	9	Crystalline dolomite	dolomite, calcite
71) 542	9	Crystalline dolomite	dolomite, calcite
72) 545	1	Dolomitic grainstone	dolomite, calcite
73) 546	6	Foraminiferal packstone	calcite, dolomite
74) 548	2	Foraminiferal grainstone	calcite, dolomite

U. of Fl. Data

TR16-2

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)		Microfacies Number and Name		XRD Mineralogy (in decreasing abundance)
1)	105.5	4	Bioclastic wackestone	calcite, quartz
2)	115.5	6	Bioclastic packstone	calcite
3)	116	-	Mudstone	calcite
4)	120.5	6	Foraminiferal packstone	calcite
5)	123	4	Foraminiferal wckstn/mdstn	calcite
6)	150	6	Miliolid packstone	calcite, quartz
7)	160	6	Bioclastic packstone	calcite
8)	161.5	4	Bioclastic wackestone	calcite, quartz
9)	180.5	4	Bioclastic wackestone	calcite
10)	201.5	4	Bioclastic wackestone	calcite
11)	202	4	Bioclastic wackestone	calcite, quartz
12)	220.5	4	Silicified foraminiferal wkstn	calcite
13)	222.5	4	Bioclastic wackestone	calcite, quartz
14)	223	6	Bioclastic packstone	calcite
15)	230	6	Miliolid packstone	calcite, quartz
16)	235	6	Miliolid packstone	calcite, quartz
17)	250.5	4	Mudstone/wackestone	calcite, quartz
18)	250.8	4	Bioclastic wckstn/mdstn	No XRD
19)	258.5	4	Wackestone	calcite, quartz
20)	261	6	Miliolid packstone	calcite
21)	275.5	4	Bioclastic wckstn/pckstn	calcite, quartz
22)	290	4	Bioclastic wckstn/pckstn	calcite, quartz

TR16-2

Thin-Section and X-ray Diffraction (XRD) Analyses

Sample Depth (feet below land surface)	Microfacies Number and Name	XRD Mineralogy (in decreasing abundance)
23) 301.5	6/4 Bioclastic mdstn/pckstn	calcite
24) 307	2/4 Foraminiferal grnstn/wckstn	calcite

COMPOSITE LOG TR16-2 AND TR16-2A

DEPTH (ft bls)	GENERALIZED LITHOLOGIC DESCRIPTIONS
114.5-119	**LS-wthd** @ tp; v pl orng, mcrtic pbls lined w/ dkr, pl yel-brn and dk gn-gy, clyey mtx; sln brec/ paleosol(?) cche(?), c-sd-sz piso/nod and lam crusts w/ lam fenst; FE por
119-137.5	**LS-grst** to mnr wkst @ tp; v pl orng to yel-gy and lt gy, mott; mol (ppd, gpd) (c calcarnt), foram (f calcarnt); v fri to cmtd and hd; fr por, MO (mol): smg, WP (foram): mc, BP: sms; sm vugs fild w/ dk brn wxy cly; ptchy repl cht, dk gy to blk, w/ wh fltg alchms
137.5-139.5	**LS-mdst** to wkst; yel-gy to lt gy; mol (gpd) (f calcrud), peld/intcls (m to c calcarnt); fr ind; fnt plnr lam, tub fenst; porous grst-fild vert bur/sln cav; p por, MO (gpd): smg, FE (tub): sms (p-p por) to lms;
139.5-159	**LS-grst** to pkst; v lt gy; cor (brhg) (f to m calcrud), mol (gpd, ppd) (f calcrud), foram (mld, pld) (vf to m calcarnt); fr hd; unlam; p to fr por, WP (foram): mc, BP: mc to lms, MO (cor, mol): lms to lmg; sme por fild w/ brn wxy cly; sme Fe-stn
159-164	**LS-pkst**; v lt gy to yel-gy; mol (gpd, ppd) (f calcrud), foram (mld) (vf to f calcarnt), ost(?); v fri to pwdy; wrm tub; p por, WP (foram), BP: sms, MO (mol): lms
164-169	**Ctgs**-f to c calcarnt-szd frags; v pl orng to yel-gy, and com qtz sd and slt--cvg?
169-185	**LS-pkst to grst**; v lt gy to yel-gy; mol (gpd, ppd) (m to c calcarnt), intcls(?), peld(?), foram (mld) (vf to f calcarnt); hd; p to g por, WP (foram): sms, MO (mol): lms to smg; rexld to mcrspr; cmtd w/ calc spr intcal m bds of **LS-mdst**, hom, unlam to plnr lam to tub fenst and biotur w/ biopelspr-fild bur; FR POR, FE (tub): sms
185-189.5	**LS-wkst**; thn to m intrbdd v pl orng; foram (f to c calcarnt) mcrtzd; sft, pwdy; biotur; p to fr por, WP: mc and - yel-gy to lt ol-gy; cor (f calcrud), mol (ppd, gpd) (c calcarnt), intcls, foram (f to m calcarnt); hd to sft, pwdy; wspy carb lam; wrm tub; p to fr por, MO (cor, mol): smg
189.5-201	**DOLMTC LS-pkst** to wkst; lt ol-gy to gy-orng; mol (ppd) (f calcrud), cor (f calcrud), intcls, peld, foram (f to m calcarnt) mcrtzd; hd to brt, sme inclnd wspy lam; fr to g por, MO (cor, mol, foram): mc to lms; cmtd w/ vf xln calc spr; m xln dol(?); sme ptg of dk brn wxy cly
201-202	**DOLMTC LS-mdst**; pl yel-brn to dk yel-brn; sft, fri; lam w/ nplnr, ev to wvy, wspy carb; pyr; ptchy por: sms intcal thn wvy lyrs of **LS-pkst**; intcls (f calcrud), foram (m calcarnt) mcrtzd; dol(?)
202-204	**LS-pkst**; pl yel-brn to dk yel-brn; mol (lrg brd ppd) (f calcrud), peld, intcls, foram (mld) (m to c calcarnt) mcrtzd; hd, brt; biotur mott; p por, WP: mc, MO (mol): sms; sme calc spr cmt
204-206	**LS-wkst**; pl yel-brn; rr foram (f to m calcarnt) mcrtzd, abd vf qtz sd; sft, pwdy; wspy carb lam
206-220	**LS-pkst** to grst; yel-gy to pl yel-brn; peld, intcls, mol (ppd,gpd) (f calcrud), abd foram (m to c calcarnt); fri to sft, pwdy; unlam to biotur; fr ptchy por, MO (mol): sms to smg, WP (foram): mc intcal thn bds of **LS-mdst**; v lt ol gy; fnt plnr lam and **LS-wkst**; yel-gy; rr intcls, com foram (m to c calcarnt) mcrtzd; fri, pwdy; wvy pll

	cont wspy lam
220-228	dscnt suf, abp ctc; rewkd pebs and qtz sd in ovlyg bd altg thn bds of **LS-pkst;** v pl orng; com f gr qtz sd, foram (f to m calcarnt) mcrtzd; fri, sft, pwdy; fr por, vug and MO(foram): sms; cmtd w/ brn calc spr and **LS-wkst;** dk yel-orng; foram (f calcarnt), sdy w/ f gr qtz; clyey; wvy wspy carb lam; p por
228-228.5	**LS-pkst;** abd hi-spired gpd
229-239	**LS-grst** to pkst; mott, pl yel-brn and m lt gy; intcls (c calcarnt), cor (f calcrud), echnd frags (c calcarnt), foram (mld) (f to c calcarnt); unlam to len bdg; fr to g, ptchy por, MO (skel): lms
239-246.5	**Ls-wkst;** pl yel-brn to yel-gy; qtz-c slt to vf sd, peld, biocls and foram (vf to f calcarnt); fr por, BP, WP, MO: mc to sms; p cmtd, in pt, w/ calc spr
246.5-255.5	altg thn bds of **LS-pkst** to wkst; dk gy-orng; mol (lrg ppd, lrg gpd) (f calcrud), foram (mld, dtcn) (m to c calcarnt); hd to fri; dolo(?) f xln; carb flks; fr por, WP, BP, sme MO (mol, foram): lms and **LS-mdst** to wkst; pl orng to gy-orng; rr foram (f to m calcarnt); pwdy; unlam to wspy carb lam; clyey; p por
255.5-259	**LS-mdst** to spse wkst; pl yel-brn to dk yel-brn; rr intcls (f calcrud), rr mol (gpd), foram (vf to f calcarnt), blk carb matt; ev to curv to wvy, wspy carb lam; n por
259-270	**LS-grst** to pkst; pl yel-brn; rr mol (gpd) (f calcrud), biocls and foram (mld) (f to c calcarnt), sbrdd qtz sd, abd carb matt; fri; unlam; p por, BP and WP, MO (mol, foram): lms; cmtd w/ calc spr, also mcrspr and chty intcal in up pt w/ thn bds of **LS-mdst to wkst;** biocls and foram (vf to m calcarnt); len bdg and wspy carb lam; abd hi-spired gpd in pt
270-276.5	**LS-pkst, bcmg grst, up;** pl yel-brn to dus yel; mol (thk shl ppd) (f to m calcrud), biocls (f to m calcrud), abd foram (mld, dtcn) (vf to vc calcarnt, incrg c up); hd, but fri; unlam; tt @ btm, fr to g por, incrg up, WP (foram) and BP: mc to sms, sme MO (mol): lms; sme blk carb matt in por @ btm
276.5-279	**LS-pkst;**ol gy; bryz, biocls, foram (f calcarnt); len bdg, abd wspy carb lam, inclnd in pt; p por; cht
279-284.5	a/a 270-279 **DOLMTC LS-pkst;** v pl orng to gy-orng; peld(?), intcls(?), rr to com mol (gpd) (c to vc calcarnt), foram f to m calcarnt), blk flks (vf sd-sz), qtz sd @ btm; incrg c up; fri to pwdy; wspy carb lam @ btm bcmg unlam up; fr to g por, incrg up, WP, BP, sli MO (mol): mc to sms; sme calc spr cmt @ btm; sme tn anhd m xln dol(?) in up pt
284.5-289.5	**DOLMTC LS-grst** to pkst; v pl orng to dk yel-orng; echnd <u>in situ</u>(?), mol (blk ppd); foram (dtcn) (m to c calcarnt), w srtd; v fri; wspy carb lam @ btm; fr to g por, incrg up; m xln dol(?) rhb in strks of mdst
289.5-295.5	**DOLMTC LS-pkst;** gy-orng to pl yel-brn; echnd and spns (f calcrud), mol (ppd, gpd) (f calcrud), intcls(?) (f calcarnt) @ btm, foram (f to m calcarnt) blk carb flks; incrg c up; unlam @ btm, bcmg wspy carb lam in up pt; p por, WP and BP: mc; m xln dol(?) rhb
295.5-300	**DOLMTC LS-qtz slty wkst** to pkst; dus yel; abd qtz (slt to f sd); mcrtic mtx; ev pll cont lam undlyg pkst; abd m to dk gy gr (f to c calcarnt); foram (f to m calcarnt), qtz slt; sft; unlam to org ptgs; dol(?)

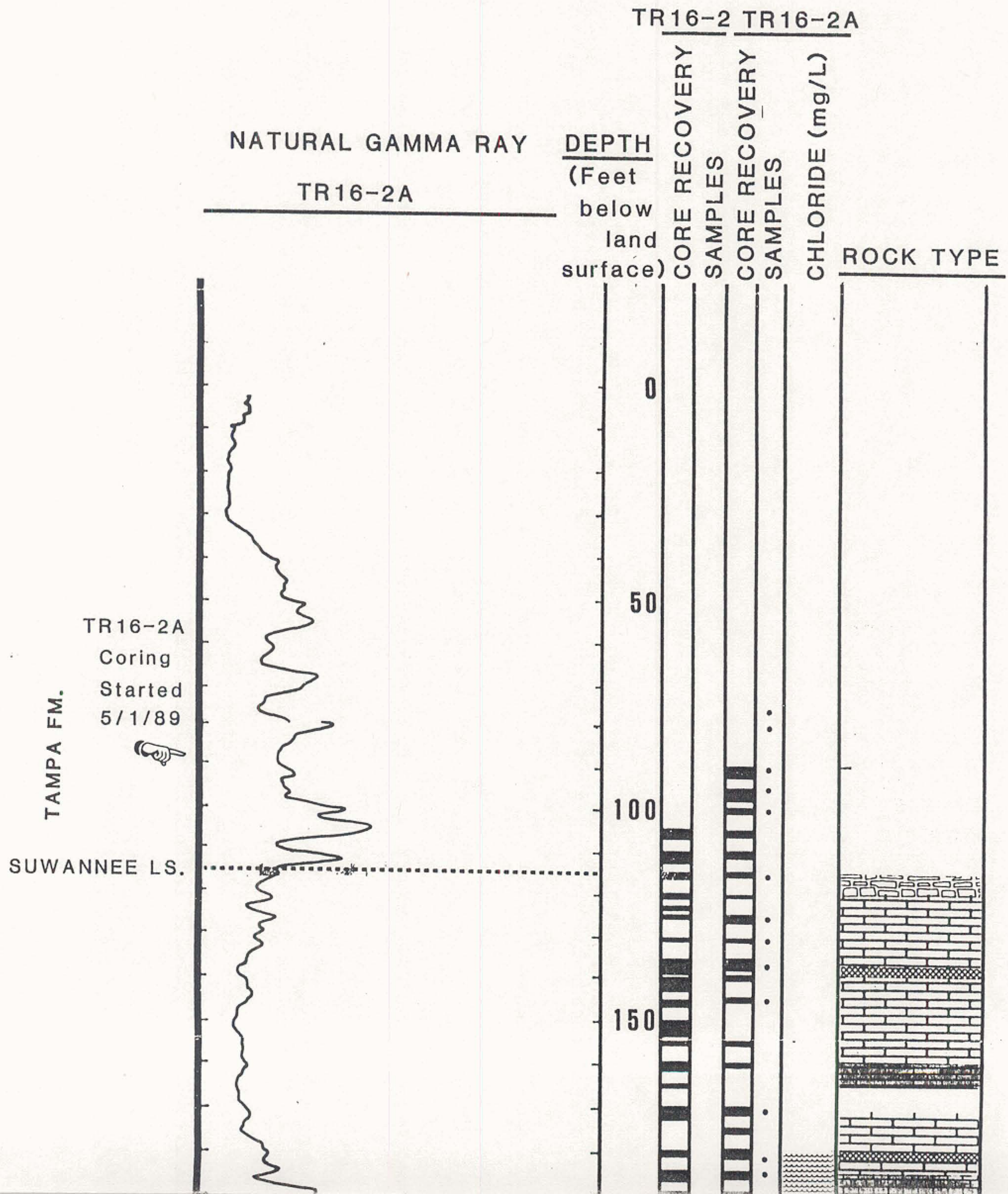
300	**Org-rich mdst**; dk yel-brn; ev pll lam; v thn bd; sft poss dscnt suf @ 301
300-311	**LS-pkst** to grst; lt ol gy to m bl-gy, sme mott; rr intcls, biocls (frags of mol, echnd) (f calcrud), abd m to dk gy gr=peld/rndd intcls(?) (f to c calcarnt), com to abd foram (mld, etal) and biocls (f to c calcarnt); f gr and bet srtd @btm and tp, c gr and p srtd in mid; fri to pwdy; unlam; ptchy p por, WP (foram): mc, BP: mc to sms, fw MO (mol)/vugs; por lined w/ f xln calc spr
311-315	**LS-wkst**; mott, yel-gy and lt gy; rr alchms, biocls and foram (mld) (f to c calcarnt); rr mol (hi-spired gpd) (f calcrud) in pt; ind; unlam to v fnt plnr lam in pt; v biotur, abd tub fenst and brg/bur; fr por, FE (tub): sms, BO:smg mnr dscnt @ 314 w/ trunc bur
315-327.5	grdatnly altg lyrs of **LS-wkst**;v pl orng; peld/biocls/foram (vf calcarnt), w srtd, hom; unlam; n por and **LS-pkst**; yel-gy; rr to com echnd and mol (ppd) frags (f calcrud), abd biocls and foram (mld, etal) (m to c calcarnt); p srtd; unlam, p to fr por, WP (foram): mc, BP: mc to sms, MO (mol): lms to smg
327.5-357	**LS-"mdst" to spse wkst**; v pl orng to yel-gy; mtx is hom, vf calcarnt/m xln, rexlzd(?) mdst; peld(?), rr biocls (frags of mol, echnd and bryz) and foram (lep) (f to m calcarnt); n por except BC/BP:mc
357-429	grdatnly altg lyrs of **LS-"mdst" to spse wkst**; v pl orng to yel-gy; mtx of vf calarnt/m xln rexlzd mdst(?), rr biocls (frags of mol, inclg thn shl and costate ppd, and echnd), rr lrg foram (numu, lep) (c calcarnt to f calcrud); sli fri in pt; unlam; p por, WP (foram): mc and **LS-wkst to pkst**; dk yel-orng to gy-orng; com to abd foram (numu, lep) (c calcarnt to f calcrud), other foram (f calcarnt), also mol (ppd, gpd), bryz, wrm tub/bur in pt; hd to fri; unlam to biotur; p por, WP (foram): mc, BP:mc to sms
429-451	**LS-pkst**; gy-orng to pl yel-brn; pwdy mcrtic mtx, rr to com lrg foram (lep) (c calcarnt to f calcrud) in pt, other foram, intcls, peld (f to m calcarnt), sme mol (gpd, lrg ppd, sme costate) in pt, wrm tub; hd to fri; unlam; p to g por, ptchy, WP (foram), BP (sln enhanced), MO (mol, foram): sms to smg
451-468	**LS-grst**; v pl orng; abd foram (m to c calcarnt) mcrtzd, also mol (gpd, ppd, sme lrg), bryz, ost, intcls, wrm tub, carb flks in pt; hd, w ind; unlam; tt to p to fr por, WP, BP, sme MO (mol): sms to lms; w cmtd w/ blky, por-filg, calc spr, sme dog-tooth linings, blk carb matt lining sme por intcal thn bds (2 to 3 ft apart) of LS-wkst to pkst; gy-orng to pl yel-brn; foram and intcls (f to m calcarnt); abd wvy pll blk carb lam
468-478	**LS-pkst**; pl yel-brn; biocls, foram (c calcarnt to f calcrud), mol (gpd, ppd), wrm tub, intcls in pt; more ind in pt; unlam but sme alignmt of elg gr; p por, WP:sms to lms, SH and MO in pt:lms to smg
478-499	**LS-pkst**; v pl orng; foram (f to m calcarnt), sme other biocls (ppd frags) hom, unlam to fnt ev pll cont horz lam in pt, to irreg mott @ tp (sln cav); p por, WP: mc, sme BP: sms
499-526	**LS-pkst to grst**; gy-orng to pl yel-brn; foram (dtcn) (f calcrud) and (mld) (f to m calcarnt) mol (ppd, gpd); bryz, echnd; fri to hd; unlam to v thn wvy pll cont inclnd lam to biotur, mott; p to fr por, WP, BP, MO (lrg mol shl): sms to lms; cmtd w/ blky calc spr 507.5 v thn bd of blk carb wvy pll cont lam
526-532.5	**LS-grst**; gy-orng; biocls, foram (dtcn) (f calcrud) and (mld) (m to c calcarnt); carb flks; fr hd; unlam to thn to med wvy to curv npll dscn lam; p por, WP, BP, sme MO; sli dolmtc in pt

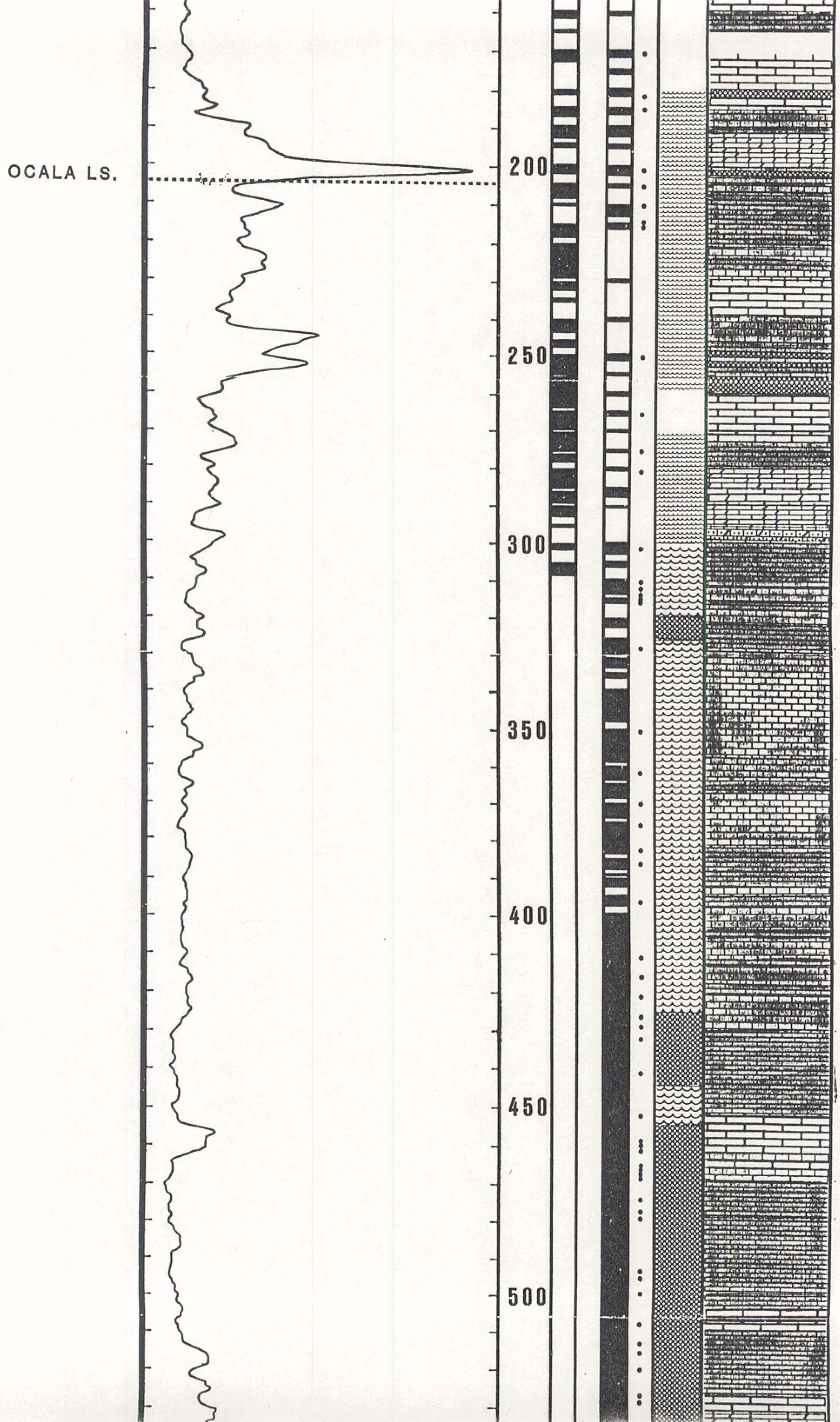
532.5-547.5	**DOLMTC LS TO DOLST-pkst to grst**; mott, v pl orng and mod to dk yel-brn, mol (ppd) (f calcrud), mcrtzd foram (dtcn) (f calcrud) and (mld) (f to m calcarnt), biocls, sme intcls; sme carb matt; hd to fri; unlam to v thn wvy npll dscn carb lam; p to fr por, WP, BC and MO (foram): lms; dolmtc to perv dolmtzd w/ m to c xln rhb
	540 thn bd of blk carb clyey mat
547.5-548.5	**LS-grst**; gy-orng; foram (dtcn, mld, etal) a/a; un lam; g por; BP, BC; drus calc(?) spr and isopachous blad cmt
TOTAL DEPTH	

COMPOSITE LOG

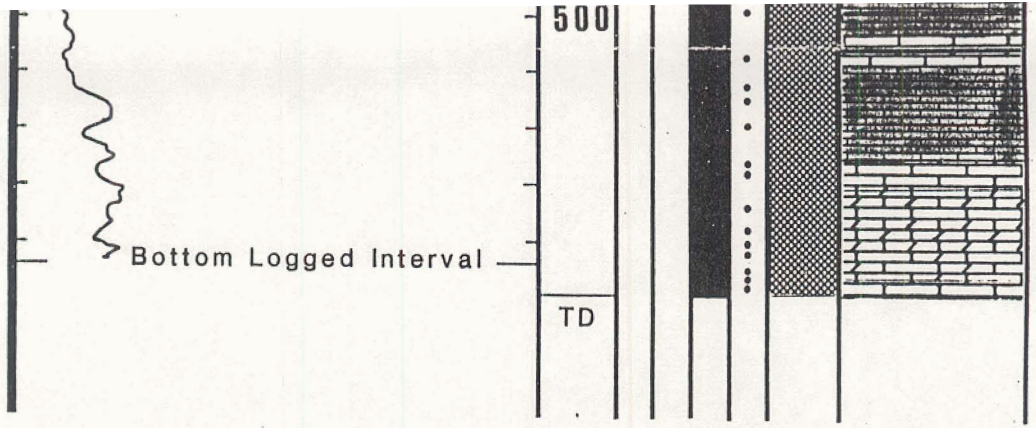
TR16-2 AND TR16-2A

J. L. Jee 01/90





OCALA LS.
200
250
300
350
400
450
500



EXPLANATION

Core Recovery

- Recovered
- No Recovery

Chloride (Cl^-, mg/L)

- < 1,000
- ≥ 1,000 < 2,000
- ≥ 2,000 < 10,000
- ≥ 10,000

Rock Type

- Mudstone
- Wackestone
- Packstone
- Grainstone
- Quartz Sand
- Dolomite
- Weathered Limestone

LITHOLOGIC WELL LOG PRINTOUT

SOURCE - FGS

WELL NUMBER: W- 16609
TOTAL DEPTH: 00549 FT.
SAMPLES - NONE

COUNTY - PASCO
LOCATION: T.26S R.16E S.09DA
LAT = N 28D 15M 18
LON = W 82D 42M 43

COMPLETION DATE - 05/14/89

ELEVATION - 035 FT

OTHER TYPES OF LOGS AVAILABLE - ELECTRIC, GAMMA, GAMMA-GAMMA, NEUTRON

OWNER/DRILLER: ROMP TR 16-2A (VAN BUREN); SWFWMD; DRILLED BY LH JOHNSON, JP MEADORS.

WORKED BY: D.J. DEWITT; HOLLOW STEM AUGER 0-48', WIRELINE CORE 48-549'.
CUTTINGS COLLLECTED WHERE CORE RECOVERY WAS POOR. ENTERED BY
RICHARD GREEN 12\90.

0. -	35.	UNDIFFERENTIATED SAND AND CLAY
35. -	119.	TAMPA MEMBER OF ARCADIA FM.
119. -	320.	SUWANNEE LIMESTONE
320. -	461.	OCALA GROUP
465. -	549.	AVON PARK FM.

0 - 1 SAND; DARK YELLOWISH BROWN TO MODERATE YELLOWISH BROWN; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE;
ROUNDNESS: SUB-ANGULAR TO ROUNDED; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MOTTLED, STREAKED,
ACCESSORY MINERALS: IRON STAIN-15%, LIMESTONE-02%, PLANT REMAINS- %, CHERT- %;
FOSSILS: PLANT REMAINS, FOSSIL FRAGMENTS;
GRAYISH-DK TAN, FINE GRAINED ORGANICS, ROOTS, LS AND SHELL FRAGS, CHERT CHIP.

1 - 3.5 SAND; YELLOWISH GRAY TO GRAYISH ORANGE; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE;
ROUNDNESS: ROUNDED TO SUB-ANGULAR; MEDIUM SPHERICITY; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MOTTLED, STREAKED,
ACCESSORY MINERALS: IRON STAIN-%;
LT GRAY-TAN, FINE GRAINED QTZ, IRON STAINS, ORGANICS, MINOR ROOTS.

3.5- 4 AS ABOVE
GRADING INTO LT TAN QTZ SAND; MINOR LS PEBBLES, BLK ORGANICS.

4 - 6.5 AS ABOVE
VERY MINOR IRON STAINING, CLEAN, WELL SORTED.

6.5- 9 AS ABOVE

9 - 11.5 AS ABOVE

11.5- 14 SAND; YELLOWISH GRAY TO GRAYISH ORANGE; INTERGRANULAR; UNCONSOLIDATED;

14 - 16.5 AS ABOVE

16.5- 19 AS ABOVE

19 - 25.5 SAND; GRAYISH BROWN TO MODERATE YELLOWISH BROWN; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO VERY FINE; UNCONSOLIDATED;

25.5- 26 SAND; DARK YELLOWISH BROWN TO MODERATE BROWN; INTERGRANULAR;
GRAIN SIZE: VERY FINE; RANGE: VERY FINE TO FINE; UNCONSOLIDATED;
GRADING TO A DK BRN, ORGANIC RICH QTZ SAND, POOR SORTING, SILTY.

26 - 29.5 SAND; MODERATE BROWN TO GRAYISH BROWN; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM;

29.5- 30.5 SAND; MODERATE BROWN TO GRAYISH BROWN; INTERGRANULAR;
GRAIN SIZE: FINE; RANGE: FINE TO MEDIUM;
ACCESSORY MINERALS: CLAY-20%;

30.5- 32 SAND; GRAYISH BROWN TO MODERATE BROWN; INTERGRANULAR;
GRAIN SIZE: FINE; UNCONSOLIDATED;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-40%;
WELL SORTED, CLAYEY QTZ SAND.

32 - 35 CLAY; YELLOWISH GRAY TO LIGHT GREENISH YELLOW; LOW PERMEABILITY, INTERGRANULAR;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-40%, IRON STAIN-01%, LIMESTONE-05%;
HARD, DENSE, SANDY CLAY, CLEAN, V.F. WHITE QTZ SAND.

35 - 36.5 AS ABOVE
INCREASED IRON STAIN (10%), AND DK BLUE-GREEN CLAY MOTTLING.

36.5- 37.5 LIMESTONE; VERY LIGHT ORANGE TO WHITE; 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-30%, QUARTZ SAND-10%, IRON STAIN-05%;
OTHER FEATURES: CHALKY;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
FIRST WATER LEVEL- 34.5', TOP OF FLORIDAN AQUIFER.

37.5- 44.5 CLAY; YELLOWISH GRAY TO LIGHT GRAY; INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: QUARTZ SAND-30%, IRON STAIN-40%, LIMESTONE-05%;
OTHER FEATURES: CALCAREOUS;
FOSSILS: FOSSIL MOLDS;

44.5- 45.5 LIMESTONE; WHITE TO VERY LIGHT ORANGE; MOLDIC, INTERGRANULAR, POSSIBLY HIGH PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: IRON STAIN-05%, CALCITE-01%;
MINOR IRON STAIN- IN FOSSIL MOLDS, V. MINOR RECRYSTALLIZATION.

45.5- 48 LIMESTONE; VERY LIGHT ORANGE TO LIGHT YELLOWISH ORANGE; LOW PERMEABILITY, INTERGRANULAR,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, CLAY MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: CLAY-40%, QUARTZ SAND-20%, IRON STAIN-10%;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
LS CLASTS IN CLAY MATRIX. LOOSELY CONSOLIDATED.

48 - 50.5 LIMESTONE; VERY LIGHT ORANGE TO WHITE; INTERGRANULAR, MOLDIC, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: HEMATITE- %, QUARTZ SAND-05%, IRON STAIN-01%, CLAY- %;
OTHER FEATURES: CHALKY, PARTINGS;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS;
MARLY, WITH V. MINOR IRON STAIN AND ORGANIC SPECKS.

50.5- 67.5 LIMESTONE; VERY LIGHT ORANGE TO WHITE; 05% POROSITY, INTERGRANULAR, MOLDIC,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
ACCESSORY MINERALS: CLAY-10%, IRON STAIN-05%, CLAY-01%;
OTHER FEATURES: SUCROSIC;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
VERY HARD, RECRYSTALLIZED, CALCITE FILLED MOLDS, LESS IRON IN LOWER SECTIONS.

67.5- 71 CLAY; LIGHT GREENISH GRAY TO GREENISH GRAY; INTERGRANULAR, LOW PERMEABILITY, FRACTURE;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: LIMESTONE- %, IRON STAIN-%;
DENSE MONTMORILLONITE, GRADING TO A LS FRAGMENT-CLAY MATRIX.

71 - 99.5 LIMESTONE; VERY LIGHT ORANGE; 30% POROSITY, MOLDIC, PIN POINT VUGS, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED,
ACCESSORY MINERALS: CLAY-02%, CALCITE-01%, IRON STAIN-01%;
FOSSILS: MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
CALCITE COATED MOLDS, INFILLED BURROWS, MINOR CLAY LAYERS, FRACT. INFILL.

99.5- 109 CLAY; LIGHT OLIVE TO YELLOWISH GRAY; LOW PERMEABILITY, FRACTURE; MODERATE INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED, INTERBEDDED,
ACCESSORY MINERALS: LIMESTONE-30%, IRON STAIN-05%;
OTHER FEATURES: CALCAREOUS, PLASTIC;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;
POOR RECOVERY, INTERBEDDED CLAY AND LS, APPROX 10% LS.

109 - 114 LIMESTONE; WHITE TO VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: CLAY-01%;
OTHER FEATURES: CHALKY;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;

114 - 119 LIMESTONE; VERY LIGHT ORANGE TO WHITE; 10% POROSITY, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, NODULAR,
ACCESSORY MINERALS: CLAY-05%, IRON STAIN-02%;
FOSSILS: FOSSIL MOLDS;
4" BED OF DENSE, DK GR-GRN WAXY CLAY AT TOP OF INTERVAL.

119 - 124 CALCARENITE; VERY LIGHT ORANGE TO GRAYISH ORANGE; INTERGRANULAR;
GRAIN TYPE: BIOGENIC, INTRACLASTS;
POOR INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: CLAY- %, IRON STAIN-%;
NO CORE RECOVERY. CUTTINGS DESCRIPTION.

124 - 128.3 CALCARENITE; VERY LIGHT ORANGE TO PINKISH GRAY; 20% POROSITY, INTERGRANULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, INTRACLASTS;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: QUARTZ-01%, CALCITE-01%;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;
SILICA REPLACED MOLLUSKS, CALCITE LINED MOLDS, POOR RECOVERY.

128.3- 129 CHERT; MODERATE GRAY TO DARK GRAY; LOW PERMEABILITY, MOLDIC; GOOD INDURATION;
CEMENT TYPE(S): SILICIC CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: LIMESTONE-40%;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS;
CHERT REPLACED LS W/ CARBONATE INFILLED VUGS AND BURROWS.

129 - 144 CALCARENITE; VERY LIGHT ORANGE; 30% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC, INTRACLASTS;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED,
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA;
SORITES SP. COMMON, SMALL CHERT LENS, SILICA REPLACEMENT AT 138', V.F. GRAINED AND CHALKY IN PLACES, CALCILUTITE LENSES.

144 - 159 AS ABOVE
CORAL MOLDS 148-149', INTERBEDDED CALCILUTITE.

159 - 164 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT GRAY; 20% POROSITY, MOLDIC, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: FOSSIL MOLDS, MOLLUSKS;

164 - 169 CALCARENITE; VERY LIGHT ORANGE;
GRAIN TYPE: INTRACLASTS, BIOGENIC;
POOR INDURATION;
NO CORE RECOVERY, CUTTINGS DESCRIBED.

169 - 184.5 CALCARENITE; YELLOWISH GRAY; 25% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: FOSSIL MOLDS, MOLLUSKS, ECHINOID;
NO CORE RECOVERY 169-179', POORLY LITHIFIED CALCARENITE.

184.5- 191 CALCARENITE; YELLOWISH GRAY; 30% POROSITY, MOLDIC, PIN POINT VUGS, VUGULAR;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: CALCITE-02%;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, CORAL;
UPPER INTERVAL HIGHLY FOSSILIFEROUS, V.F. CALCITE XLS IN MOLDS.

191 - 204 AS ABOVE
MINOR BRN, ORGANIC CLAY SEAMS, SOME BEDDED FINE GRAINED CALCARENITE.

204 - 205 LIMESTONE; GRAYISH BROWN TO DARK YELLOWISH BROWN; 05% POROSITY, PIN POINT VUGS,
LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
ACCESSORY MINERALS: SILT-20%, LIMESTONE-10%;
OTHER FEATURES: LOW RECRYSTALLIZATION, SPECKLED;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, ORGANICS;

205 - 209 NO SAMPLES

209 - 215 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 35% POROSITY, INTERGRANULAR, MOLDIC,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA, CORAL;

215 - 219 CALCARENITE; GRAYISH ORANGE TO GRAYISH YELLOW; 20% POROSITY, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: LAMINATED, INTERBEDDED,
ACCESSORY MINERALS: SPAR-01%, SILT-05%;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, CORAL, BRYOZOA;

219 - 229 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE;
POOR INDURATION;
ACCESSORY MINERALS: SPAR-%;
NO CORE RECOVERY, CUTTINGS DESCRIBED.

229 - 250 AS ABOVE
POOR RECOVERY, SOFT, POORLY INDURATED CALCARENITE, ORGANIC PARTINGS, INTERBEDDED V.F.
CALCARENITE.

250 - 254 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 25% POROSITY, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BANDED, BIOTURBATED,
ACCESSORY MINERALS: CALCITE-10%;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, DOLOMITIC;
FOSSILS: FOSSIL MOLDS, MOLLUSKS;
CAVITY AT BOTTOM OF INTERVAL. 253-254'.

254 - 258 AS ABOVE

258 - 259 LIMESTONE; YELLOWISH GRAY TO GRAYISH BROWN; 05% POROSITY, INTERGRANULAR, LOW PERMEABILITY;
GRAIN TYPE: CALCILUTITE;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: LAMINATED, STREAKED,
ACCESSORY MINERALS: SILT-05%, PLANT REMAINS- %;
OTHER FEATURES: DOLOMITIC, PARTINGS;
FOSSILS: ORGANICS;

259 - 286 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 30% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
OTHER FEATURES: DOLOMITIC, LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA, ORGANICS;
COMMON DICTYOCONUS COOKEI, OTHER FORAMS NEED I.D.

286 - 294 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: MOTTLED, BIOTURBATED, BEDDED,
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ECHINOID, ORGANICS;

294 - 299 CALCARENITE; YELLOWISH GRAY TO GRAYISH BROWN;
GRAIN TYPE: BIOGENIC;
POOR INDURATION;
OTHER FEATURES: DOLOMITIC;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA;
NO CORE. CUTTINGS DESCRIBED. CAVITY 297-301' ON CALIPER LOG.

299 - 302 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ORGANICS;

302 - 311 CALCARENITE; YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BEDDED,
ACCESSORY MINERALS: SILT- %;
OTHER FEATURES: LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ORGANICS;
ABUNDANT ECHINOID FRAGMENTS, ORGANIC SILT IN CUTTINGS 299-304'. SILTY-WAXY ORGANICS IN CUTTINGS 304-309', INTERSTITIAL GRAY CALCILUTITE IN PARTS REDUCED POROSITY. FINELY BEDDED TAN CALCILUTITE LOWER INTERVAL.

311 - 318.5 LIMESTONE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, MOLDIC, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: CALCILUTITE, BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED, INTERBEDDED,
ACCESSORY MINERALS: SILT- %, CLAY- %;
OTHER FEATURES: LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA, ORGANICS;
COMMON GASTROPOD MOLDS, MINOR SEAMS OF BRN, WAXY ORGANIC CLAY. SUWANNEE-OCALA CONTACT, 320'.

318.5- 320.5 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 20% POROSITY, MOLDIC, INTERGRANULAR, VUGULAR;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, WORM TRACES, BENTHIC FORAMINIFERA;
FIRST OCCURRENCE OF LEPIDOCYCLINA SP.

320.5- 329 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA;
FINE GRAINED CALCARENITE.

329 - 358 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR,
PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
OTHER FEATURES: GRANULAR;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS;
LEP. OCALANA COMMON, V.F. GRAINED CALCARENITE.

358 - 361 AS ABOVE
COARSER GRAINED. FIRST OCCURRENCE OF NUMMULITES (OPERCULINOIDES).

361 - 366 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 10% POROSITY, INTERGRANULAR;
GRAIN TYPE: SKELETAL, BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS;
ABUNDANT NUMMULITES V.; LEPIDOCYCLINA COMMON, PECTEN SHELLS.

366 - 374.5 AS ABOVE
ABUNDANT PECTEN SHELL FRAGMENTS, NUMMULITES, LEPS COMMON.

374.5- 389 AS ABOVE
GASTROPOD MOLDS, VARIABLE COARSENESS WITH FOSSIL ABUNDANCE INTERBEDDED.

389 - 394 CALCARENITE; YELLOWISH GRAY TO VERY LIGHT ORANGE; 15% POROSITY, INTERGRANULAR, MOLDIC;
GRAIN TYPE: BIOGENIC, SKELETAL;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED,
ACCESSORY MINERALS: SPAR- %;
FOSSILS: BENTHIC FORAMINIFERA, MOLLUSKS, FOSSIL FRAGMENTS, FOSSIL MOLDS;
GRAY LEPIDOCYCLINA COMMON, RECRYSTALLIZED NUMMULITES, MOLLUSK MOLDS.

394 - 420.5 AS ABOVE
INTERBEDDED FORAMINIFERAL LAYERS AND FINE GRAINED CALCILUTITE, NUMMULITES COMMON TO
ABUNDANT, LEPS. COMMON.

420.5- 428.5 CALCARENITE; YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MOTTLED, BANDED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, FOSSIL MOLDS, MOLLUSKS, ECHINOID;
FINE GRAINED, INTERBEDDED FORAM BEDS, NUMMULITES, LEPS, PECTEN FRAGMENTS.

428.5- 450 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR, MOLDIC, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BIOTURBATED, BANDED,
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA, MOLLUSKS, WORM TRACES;
INTERBEDDED F-C CALCARENITE; INFILLED BURROWS.

450 - 454 CALCARENITE; VERY LIGHT ORANGE TO YELLOWISH GRAY; 20% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
OTHER FEATURES: GRANULAR, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, MOLLUSKS, ECHINOID;
COARSE GRAINED, GOOD PERMEABILITY.

454 - 459.5 AS ABOVE
FINER THAN ABOVE, PACKED TIGHTER, SLIGHTLY LESS PERMEABLE, TOP OF AVON PARK FM 459.5-465'.

459.5- 461 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 10% POROSITY, INTERGRANULAR, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: GRANULAR, MEDIUM RECRYSTALLIZATION, STROMATAL;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ECHINOID, MOLLUSKS;
ORGANIC RICH, FINE GRAINED BED AT TOP OF INTERVAL, LAMINATED.

461 - 463 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 05% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED, STREAKED, BIOTURBATED,
ACCESSORY MINERALS: PLANT REMAINS- %;
OTHER FEATURES: LOW RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, ORGANICS, WORM TRACES;

463 - 464 CALCARENITE; YELLOWISH GRAY; 05% POROSITY, PIN POINT VUGS, MOLDIC;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;
FOSSILS: FOSSIL MOLDS, MOLLUSKS, FOSSIL FRAGMENTS, CORAL;

464 - 465 SAME AS 461-463', ORGANIC LENSES, FLASER BEDDED? STROMATOLITE?.

465 - 467.5 CALCARENITE; YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT, CALCILUTITE MATRIX;
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, MOLLUSKS, BENTHIC FORAMINIFERA;
FIRST DICTYOCONUS AMERICANUS AT APPROX. 466'. COARSER GRAINED AT BOTTTOM OF INTERVAL.

467.5- 478 CALCARENITE; YELLOWISH GRAY; 15% POROSITY, INTERGRANULAR;
GRAIN TYPE: BIOGENIC, SKELETAL;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MOTTLED, BANDED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION, GRANULAR;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA;
COARSE FORAM PACKSTONE, SOME INTERBEDDED FINER CALCARENITE.

478 - 482 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 10% POROSITY, INTERGRANULAR, VUGULAR;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BIOTURBATED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, WORM TRACES;

FINER GRAINED, ABUNDANT INFILLED BURROW STRUCTURES.

482 - 499.5 AS ABOVE
MINOR BURROW STRUCTURES, MORE POROUS AT BOTTOM OF INTERVAL.

499.5- 514 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 10% POROSITY, INTERGRANULAR, VUGULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BANDED, BIOTURBATED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, FOSSIL MOLDS, ORGANICS;
ORGANIC SEAM AT 507.5', CALCILUTITE BED AT 512'.

514 - 516.5 CALCARENITE; YELLOWISH GRAY; 10% POROSITY, INTERGRANULAR, FRACTURE, PIN POINT VUGS;
GOOD INDURATION;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA;
SOME VERTICAL FRACTURING. WELL CEMENTED.

516.5- 519.5 AS ABOVE
SAME AS 499.5-514'.

519.5- 522 CALCARENITE; YELLOWISH GRAY; 05% POROSITY, MOLDIC, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE,
ACCESSORY MINERALS: SPAR- %, PLANT REMAINS- %;
OTHER FEATURES: HIGH RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, FOSSIL MOLDS, BENTHIC FORAMINIFERA, ORGANICS;

522 - 523 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 02% POROSITY, INTERGRANULAR,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CALCILUTITE;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, ORGANIC MATRIX;
SEDIMENTARY STRUCTURES: INTERBEDDED, LAMINATED,
ACCESSORY MINERALS: PLANT REMAINS- %;
OTHER FEATURES: LOW RECRYSTALLIZATION, STROMATAL;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ECHINOID, ORGANICS, PLANT REMAINS;
FINE GRAINED WITH ORGANIC LAMINAE, GRADING DOWN TO COARSER GRAINED.

523 - 526.5 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 15% POROSITY, INTERGRANULAR, PIN POINT VUGS;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: SPAR- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ORGANICS, ECHINOID;

526.5- 533 CALCARENITE; YELLOWISH GRAY TO LIGHT OLIVE GRAY; 05% POROSITY, INTERGRANULAR,
PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC;
GOOD INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BANDED, BIOTURBATED, LAMINATED,
ACCESSORY MINERALS: SPAR- %, PLANT REMAINS- %, DOLOMITE- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION, SUCROSIC;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ECHINOID, ORGANICS, WORM TRACES;
V.F. GRAIN, BEDDED WITH ORGANIC MATERIAL, ECHINOID FRAGS COMMON. BECOMING DOLOMITIC AT
BOTTOM OF INTERVAL.

533 - 536.5 DOLOSTONE; DARK YELLOWISH BROWN TO DARK YELLOWISH ORANGE; 10% POROSITY, INTERGRANULAR,
PIN POINT VUGS, MOLDIC; 50-90% ALTERED; SUBHEDRAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT;
SEDIMENTARY STRUCTURES: BEDDED, MOTTLED,
ACCESSORY MINERALS: CLAY-05%, PLANT REMAINS-02%;
OTHER FEATURES: HIGH RECRYSTALLIZATION, GRANULAR, SUCROSIC, SPECKLED;
FOSSILS: ORGANICS;
V. HARD, ORIGINAL FABRIC HIGHLY ALTERED, TRACES OF ORGANIC BEDDING.

536.5- 540 CALCARENITE; YELLOWISH GRAY TO GRAYISH ORANGE; 05% POROSITY, INTERGRANULAR, PIN POINT VUGS,
LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CRYSTALS;
GOOD INDURATION;
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-05%, PLANT REMAINS-10%, SPAR- %, PEAT- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION, SPECKLED;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, ECHINOID, PLANT REMAINS, ORGANICS;
ORGANIC RICH, A FEW LIGNITE SEAMS, ECHINOID FRAGS COMMON.

540 - 543.5 DOLOSTONE; MODERATE YELLOWISH BROWN TO MODERATE DARK GRAY; 10% POROSITY, INTERGRANULAR,
PIN POINT VUGS, MOLDIC; 10-50% ALTERED; SUBHEDRAL;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SPARRY CALCITE CEMENT;
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED,
ACCESSORY MINERALS: CLAY-10%, PLANT REMAINS-01%;
OTHER FEATURES: HIGH RECRYSTALLIZATION, GRANULAR, SUCROSIC;
FOSSILS: ORGANICS, FOSSIL FRAGMENTS;
GRADES INTO A DOLOMITIC CALCARENITE.

543.5- 545 CALCARENITE; DARK YELLOWISH ORANGE TO YELLOWISH GRAY; 05% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC, CRYSTALS;
GOOD INDURATION;
CEMENT TYPE(S): DOLOMITE CEMENT, SPARRY CALCITE CEMENT, CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: MASSIVE, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE-05%, SPAR- %, PLANT REMAINS- %;
OTHER FEATURES: DOLOMITIC, MEDIUM RECRYSTALLIZATION;
FOSSILS: FOSSIL FRAGMENTS, BENTHIC FORAMINIFERA, ORGANICS;

545 - 548 CALCARENITE; YELLOWISH GRAY TO GRAYISH YELLOW; 05% POROSITY, INTERGRANULAR, PIN POINT VUGS, LOW PERMEABILITY;
GRAIN TYPE: BIOGENIC;
MODERATE INDURATION;
CEMENT TYPE(S): CALCILUTITE MATRIX;
SEDIMENTARY STRUCTURES: BEDDED, BIOTURBATED,
ACCESSORY MINERALS: DOLOMITE- %, SPAR- %, PLANT REMAINS- %;
OTHER FEATURES: MEDIUM RECRYSTALLIZATION;
FOSSILS: BENTHIC FORAMINIFERA, FOSSIL FRAGMENTS, ORGANICS;

548 - 549 AS ABOVE
SLIGHTLY COARSER GRAINED, LESS ORGANICS, MINOR VERTICAL FRACTURES.

549 TOTAL DEPTH